The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Chemical Markets of the Empire

THIS issue is another periodical reminder to our readers of the great Colonial markets outside the home country open to chemical manufacturers and exporters. More and more the horizon of the British chemical industry is widening, and the recent formation of the great chemical trust finds its chief justification and outlook in supplying primarily the needs of the Empire. The development of these great countries overseas is still in its infancy, In continents like Canada, Australia, South Africa, India and New Zealand there is an illimitable future market for the chemicals and chemical plant that must play an essential part in their progress, and the trade announcements contained in this issue will reach great numbers of potential buyers who, even if their present requirements are satisfied, will thus learn where future needs may be met out of home resources.

Export trade is, of course, not quite so simple as trade with one's next door neighbour. The conditions of the Colonial markets are different, goods require some measure of adaptation to local customs, the whole process of advertisement and marketing has to be on specially selected lines, and local fashions and prejudices, even in chemical products, need to be taken into account. All this points to the necessity of a serious study of Colonial market conditions if a reasonable share of Colonial trade is to be secured. Before the war it paid Germany and the United States to go to this trouble and expense. Equally it will pay British producers. The campaign, however, must be intelligently planned, thoroughly prosecuted, and care taken that the right goods are directed to the right markets. Every year, however, the British trader finds the conditions becoming more favourable. Such bodies as the Empire Marketing Board are not merely letting us know what the Colonies produce but equally what the Colonies need from us, and there is a wide field of education in the instruction of colonists in the numberless ways in which the products of chemical industry can be of direct service to them. For some months past our overseas chemical trade has been steadily recovering. Its future increase must largely depend on the extent to which the Colonies look to us for their supplies, and intelligent attention to the possibilities of our great Colonial markets cannot fail, in the long run, to be well repaid in permanent and remunerative custom.

Chemistry in Gas Manufacture

THE new research laboratories of the Gas Light and Coke Co., which were opened by Sir Richard Trelfall on Thursday, indicate how largely gas manufacture is now regarded as an essentially chemical industry and how far, even in the familiar field of high temperature carbonisation, chemical research is still from having reached its limits. Apart from the chemical control of operations—a factor of increasing importance in works—the research staff will find an ample field in the investigation of the mechanism of high temperature reactions and in the study of the structure and composition of the coke, tars, and other residuals. But it is clearly not for this field alone that the company has instituted this new machinery for research. Low temperature carbonisation, if it has not conspicuously established itself yet on a commercial basis, has come to be recognised as one of the processes of the future, and it is essential for any progressive organisation of the size and importance of the Gas Light and Coke Co. that it should keep pace with any new developments in this field. The Fulham chemical staff, apart from the investigation of its own domestic problems, will be in close association with the large experimental plant which the company is erecting at Richmond, under a scheme sanctioned by the Government, and with the smaller units erected by the company. These developments are matters of great public interest, and the company is to be congratulated on its enterprise.

It will not escape attention that these new gas research laboratories are but one of a series of industrial installations that have recently been noted in our columns, of which those of the Distillers Co. and J. Lyons and Co. will particularly be recalled. Not only are the principal industries of any size now convinced that a chemical research service is indispensable to their maintenance and progress, but in connection with the universities and centres of technical training, chemical research facilities are constantly being extended. What may be called academic research is thus being brought into closer contact with industrial research, to the obvious advantage of both branches, so far as they may be described as separate branches. Another gratifying feature of these changes is the scale on which chemical research is now planned. The futile idea of appointing a chemist at the lowest salary at which a qualified man can be secured, and expecting him to produce immediate results at least equal to the expenditure on his department, is now generally discredited. Where chemical services are instituted, they are now instituted on a generous scale, and it is recognised, too, that though efficiently directed research pays well in the long run, its results can never be guaranteed beforehand. The greatest results, indeed, are sometimes found where they are least expected.

Chemical Manufacturers' Outlook

THE full report published in this issue of the annual meeting of the Association of British Chemical Manufacturers is worth attention, if only because it indicates the variety of problems that chemical manufacturers have now to face. One point is made quite clear from the reading of the speeches. If ever the Association was needed, it is needed now, not merely as an instrument of negotiation with the Government on matters affecting the entire industry, such as safeguarding and dyestuffs legislation, but because of the great new orientation which is taking place in chemical industry, and which calls for the accommodation of interests at many points. The Association in these and many other matters may be able to do work of great importance.

Among the many points referred to, Dr. E. F. Armstrong selected one of particular interest relating to foreign patents. In our last Annual Review issue, a competent authority drew attention to the enormous number of foreign chemical patents taken out in this country, mainly by Germany, as compared with the number taken out by British firms, and his figures were widely quoted in the Press as indicating a certain danger to scientific developments in this country. A glance at our "Patent Literature" almost any week will reveal a long succession of patents taken out in the names of foreign firms and covering almost every phase of chemical research. It is well known that some interests prefer to rely on "secret processes" rather than to commit their work to Patent specifications, but this method has its dangers as well as its conveniences. There has been a suspicion for some time that a good proportion of foreign patents do not represent actual discovery or invention, but are designed to cover or anticipate discovery in fields where admittedly much research work is proceeding. It may thus be found that by a skilful use of our Patent Laws a genuine inventor may find his path blocked by this policy of spreading the Patent net as wide as possible and securing a comprehensive monopoly in advance.

Whether this is precisely what Dr. Armstrong has in mind one cannot say, but the matter, we know, has been causing a certain amount of anxiety for some time, and it is well to have public attention drawn to it. The plain fact is that foreign interests are making much more use of our Patent system than home interests are doing. Whether the remedy lies in a vigorous competitive policy or in some means of restricting foreign activity is not very clear. Dr. Armstrong seems to contemplate some amendment of the system which will more rigidly restrict the grant of Patents to genuine new discovery or invention. At the same time, whatever system is adopted, the interests that make the most systematic and energetic use of it must inevitably gain an advantage, and the fact at present is that foreign firms are much more active in taking out British chemical patents than British firms are.

Dr. E. F. Armstrong's Resignation

As we go to press, we are informed that Dr. E. F. Armstrong, F.R.S., late managing director of the British Dyestuffs Corporation, has resigned his post as manager of the Corporation under Imperial Chemical Industries, Ltd. The exact date at which the resignation takes effect has not yet been made public.

Books Received

DIE NATÜRLICHEN UND KÜNSTLICHEN ASPHALTE UND PECHE. By Emil J. Fischer. Dresden and Leipzig: Theodor Steinkopff. Pp. 114. 8.50 marks.

SENIOR CHEMISTRY FOR SCHOOLS. By W. R. Jamieson. London: Macmillan and Co., Ltd. Pp. 304. 9s.

REPORT ON ECONOMIC CONDITIONS IN PORTUGAL. March, 1928. By Leonard H. Leach. London: H.M. Stationery Office. Pp. 52. 1s. 6d.

A TREATISE ON CHEMICAL ENGINEERING. By Dr. Geoffrey Martin. London: Crosby Lockwood and Son. 3 guineas.

ATOMIC STRUCTURE AS MODIFIED BY OXIDATION AND REDUCTION. By William Colebrook Reynolds. London: Longmans, Green and Co., Ltd. Pp. 128. 7s. 6d.

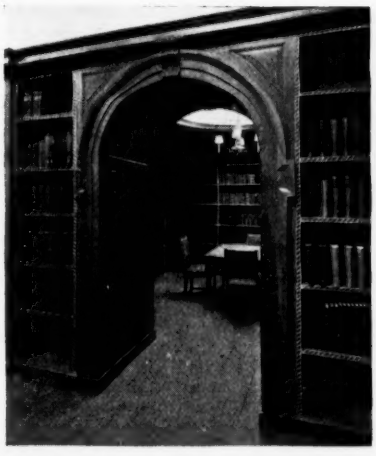
THE EXTRA PHARMACOPŒIA OF MARTINDALE AND WESTCOTTS. Revised by W. Harrison Martindale. London: H. K. Lewis and Co., Ltd. Pp. 1207.

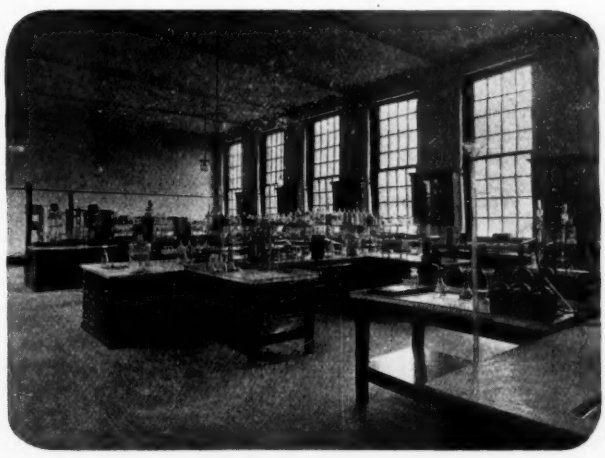
THE COLLOIDAL SALTS. By Harry Boyer Weiser. London: McGraw-Hill Publishing Co., Ltd. Pp. 404. 25s.

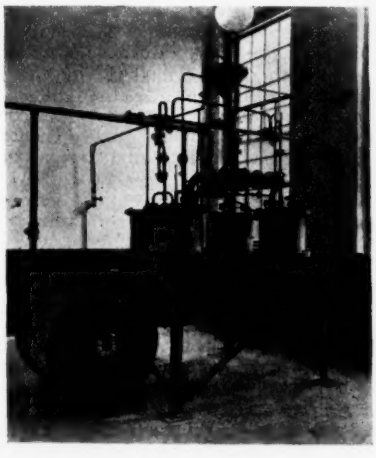
The Calendar

Sep. 3–7	Society of Chemical Industry: Annual General Meeting.	New York, U.S.A.
5–12	British Association Meeting.	Glasgow.
24–Oct. 6	World Power Conference. Fuel Conference.	Imperial Institute, London
28–29	Faraday Society: General Discussion on Homogeneous Catalysis.	University, Cambridge
Nov 19–24	Second International Conference on Bituminous Coal.	Pittsburgh

Gas Light and Coke Co.'s New Research Laboratories







EXTERIOR AND INTERIOR VIEWS OF THE NEW RESEARCH LABORATORIES OF THE GAS LIGHT AND COKE CO. AT THE FULHAM WORKS, TOGETHER WITH A PHOTOGRAPH OF THE CHIEF GAS CHEMIST, MR. H. HOLLINGS. THE LABORATORIES WERE OPENED BY SIR RICHARD THRELFALL ON THURSDAY

Problems Before the British Chemical Manufacturer

Reviewed at the Annual Meeting of the A.B.C.M.

The annual meeting of the Association of British Chemical Manufacturers was notable for the frankness with which various problems affecting the position of the chemical manufacturer were discussed. Speeches were delivered by the Chairman (Mr. C. A. Hill), Sir Max Muspratt, Mr. J. W. Wilson, Dr. E. F. Armstrong, and others.

The twelfth annual general meeting of the Association of British Chemical Manufacturers was held at the Chemical Society's Rooms, Burlington House, London, on Thursday, July 12.

The Chairman's Address

The Chairman (Mr. C. A. Hill), in moving the adoption of the report, expressed the great pleasure which the members of the Association felt at the elevation of the vice-chairman (Sir Alfred Mond), now Lord Melchett, to the Peerage. The honour which had been bestowed upon him was a well-deserved recognition of the invaluable services he had rendered to the country generally and, in particular, to the chemical industry. A new issue of the Directory of the Association, he stated, would be brought out at the beginning of 1929, and

Mr. C. A. Hill.

the Council was most anxious that it should not only be up to the high standard of previous issues but, if possible, better.

Touching on the subject of exhibitions, the Chairman said that they all felt that exhibitions could be overdone. The considered view of the Council was that it was inadvisable to patronise more than one exhibition a year and that everything possible should be done to make that one exhibition really representative of chemical industry. The Council felt that the exhibition which the Association should support was the British Industries Fair, and they hoped it would be possible to fill the whole of the allotted space with exhibits from the Association and from the British Chemical Plant Manufacturers' Association, who it was hoped would again join them. They wanted to make the section not only once more worthy of chemical industry, but also one that would bear comparison with the chemical exhibits in any other country.

Reference was made in the report to the pamphlet on those portions of the Rating and Valuation Act, 1925, which were likely to affect chemical industrialists. It was certain that in the application of this Act many doubtful cases were likely to arise in view of the varied nature of the machinery and plant used in the industry. It was very desirable in the interests of them all that details of such doubtful cases should be reported to the Association so that members generally might be kept informed of the decisions reached in different parts of the country by the Panel of Referees. There was an undoubted necessity for co-ordination and co-operation to ensure the uniform application of the Act throughout the country, and it was particularly important that the decisions of the referees should be carefully watched, so that basic principles should not be laid down for particular cases without full consideration of their bearing on chemical industry as a whole.

The tariff situation was still one of considerable interest. The recommendations of the Economic Conference at Geneva last year had had a beneficial effect on restricting the imposition of new tariffs, and had in some cases actually produced a reduction of them in the trading agreements between various countries. The future work of the Economic Consultative Committee would require to be carefully watched when chemical products were under discussion, as this was a matter which affected the Association very closely.

Referring to the work of the Resistant Metals Committee, the Chairman said that the chemical industry was in great need of new materials for the construction of plants dealing with corrosive substances, and the production of suitable metals to meet these requirements would result in considerable financial advantage to the industry. The reorganised Resistant Metals Committee, which represented the makers of the resistant metals, the manufacturers of chemical plant, and the users of the plant, combined all the elements necessary for a concentrated and co-ordinated attack on the problems involved.

With the object of the new Budget duty, namely, the relief of depressed industries, they were all in agreement, but there had been considerable complaint in regard to the incidence of the duty on oils used as raw materials or ingredients for manufacturing processes, as this was a tax on instruments of production which, according to the Chancellor of the Exchequer himself, should not be taxed.

As regards the rating relief, which they were to obtain in another eighteen months' time, he understood that the relief to the chemical industry as a whole would be about £600,000. In case any of them might be under a misapprehension regarding the scope of the rating relief, he would draw attention to the fact that from their interpretation of the proposed Rating and Valuation (Apportionment) Bill, 1928, it would appear that the relief would apply only in respect of actual productive buildings, with an allowance of 10 per cent. for other buildings not used in actual production. Since many chemical manufacturers had a large proportion of storage accommodation, they might find that this rating relief was lower than they had anticipated.

The K.I.D. Tribunal

The first chemical case with which the tribunal, with its K.C. chairman and two scientific assessors, had dealt had been in respect of calcium biphosphate. This substance was originally included in the list of dutiable articles but was removed, together with other chemicals, by the Board of Trade in the light of decisions given by the referee, by whom cases were decided before the present tribunal was constituted. Calcium biphosphate (baking powder quality) had now been restored to the dutiable list by the tribunal, and this constituted a very important decision.

The Chairman said he had indicated a number of questions with which the Association would have to concern itself in the near future, and others would certainly arise. The Association had proved its value to the chemical industry in the past and he was sure its services would be equally required in the future. There were still many outstanding problems of great importance ahead of them. The Dyestuffs (Import Regulation) Act would expire in 1930, while in eight years the present Safeguarding of Industries Act would have run its allotted period. The expiration of these measures would entail the consideration of problems of vital significance to the industry, and would call for concentrated efforts and the utmost co-operation from all members of the Association.

Referring to changes in the staff, the Chairman said that the news of Mr. Woolcock's recent resignation from the post of general manager and secretary was received by all members with as great regret as it was by the Council. Mr. Woolcock had been with them so long that they had all come to regard him as a pillar on which the Association relied for a

great deal. It was quite unnecessary for him to say how much the chemical industry of this country owed to Mr. Woolcock. He need only mention the conspicuous part he had played in connection with those two very important protective measures, viz., the Dyestuffs Licensing Act and the Safeguarding of Industries Act. They would all be pleased to hear that Mr. Woolcock was continuing his membership of the Dyestuffs Licensing Committee and of the Dyestuffs Development Committee, of which he had for so long acted as chairman with conspicuous success. They all wished him the utmost success in his new sphere of activity.

The position created by Mr. Woolcock's resignation was carefully considered in all its aspects and it was decided to appoint Mr. Davidson Pratt to the post of general manager. Mr. Pratt was already known to many of them, since he had been associated with the Chemical Warfare Research organisation of the fighting services for the past twelve years, and for the last five years has been head of the Chemical Warfare Research Department. He wished to express their appreciation of the generous action of the fighting services in allowing Mr. Pratt to begin his new duties at very short notice. This was done on the understanding that Mr. Pratt should be allowed to devote a progressively decreasing part of his time to his old post until the question of his successor had been settled. He understood that his successor had now been nominated, so that Mr. Pratt would shortly be free from the dual burden which he had had to carry during the past two and a half months. It was hardly necessary to ask them to accord him the same full measure of help and support that they had ever given to his predecessor. On making the new appointment of general manager, the Council decided to recognise the devoted service which Miss Small had rendered for the past six years by appointing her secretary, and all who knew Miss Small would heartily endorse this action.

Sir Max Muspratt on Tariffs

Sir Max Muspratt, in seconding the adoption of the report, said that he would like to make one or two remarks with regard to exhibitions. Exhibitions had for many years past been the curse of industry, at any rate of the heavy industries and those

SIR MAX MUSPRATT.

industries not coming in direct contact with the consumer. But two great exceptions had to be made: one was Wembley and the other the British Industries Fair. There was no doubt that they had played a part in bringing before people from every part of the world what British industry was doing and what it could do, and he thought that the A.B.C.M. could feel very proud that they set to work when most people were hesitating. The success of that magnificent chemical section at the Wembley Exhibition was due to the fact that they started by backing the British Industries Fair, and he hoped that for many long years they would continue to do so.

With reference to the Association's monograph on chemical industry, he thought that last year it had an extraordinary effect in Geneva, particularly in pulling together all the English-speaking races on lines of thought that helped so much on the general resolutions they were then carrying out at the Economic Conference. The Germans very cleverly got in with a very good monograph upon the chemical industry which, not directly but by inference, implied that Germany was the only centre of the chemical industry and no other country in the world mattered. This shock the United States very badly, but they were not in a position, or at any rate were not quick enough, to get in first; and our monograph, prepared in a very few days, was probably one of the greatest triumphs the A.B.C.M. had ever achieved; in fact, it was an achievement that there would probably be no opportunity of repeating. It was desirable, when the follow-up commissions were being held upon these important subjects, that the monograph should be brought up to date, and it was very efficiently and ably brought up to date. He referred to the Chairman's remark that if the Economic Conference did nothing else it did prevent the rise in tariffs. Undoubtedly, the psychology and mentality of the world was altered to the great advantage of a comparatively free trade country such as ours. With regard to safeguarding and dyestuffs, they must remember that it was a double-edged sword. Personally, he felt that he could justify the action taken before any public tribunal of the world, under existing conditions, but it was a matter in which they must look upon both sides. If they wanted the tariffs of the world reduced they must not be too exigent as to the terms they asked for safeguarding their own industries and the retention of the Dyestuffs Act. Returning to the monograph, he pointed out that it enabled us to show to critics who said that Great Britain was no longer the great Free Trade country she had been, and therefore had no right to claim that tariffs should be reduced all round, that the chemical industry was so enormous that the comparatively small sections in which they required breathing space did not upset the great argument that, broadly speaking, as compared with the rest of the world, we were a Free Trade nation, and that if we had to make exceptions it was because they were forced upon us.

The relief of rates was a subject which he ventured to say nobody at the moment understood, but it was a great new orientation, and an industry such as the chemical industry, which had taken such a large part in forwarding every progressive movement, should wish to give the very fullest support it possibly could to the whole of this new policy, which was based upon the fundamental idea, forgotten by so many people, that, after all, production lay at the basis of the whole prosperity of thi scountry. Without production it was impossible to have payment for services of every kind, and without production and export it was impossible indefinitely to maintain the standard of living which it was desired to maintain in this country. Whatever the A.B.C.M. did in criticising this or that detail, he was sure that the Council would be imbued with the spirit that this was a great new orientation of the whole system of taxation for dealing with unemployment and with Poor Law relief, and that it required its most whole-hearted support, however strongly it may have to make representations in detail. At the same time he felt it ought to be put on record that this was a great movement for the improvement of the industries of the whole country, for the readjusting of burdens amongst the various portions of the community, and he was sure it deserved the most cordial support of the Council in every way.

After the honorary treasurer (Dr. E. F. Armstrong) had made a statement regarding the accounts, a general discussion followed.

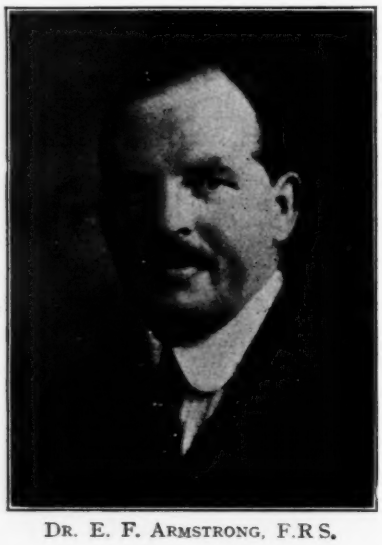
Mr. J. W. Wilson on "Big Business"

The Rt. Hon. J. W. Wilson referred to the work done by the various Group Committees, and especially their Chairman, whose valuable presence on the Council they all appreciated. He said that of necessity those groups must be the feelers of the Association for initiating new subjects, and for watching the interests of the chemical trade as a whole. Although the present commercial position of the world, and particularly of this country, had suddenly awakened to "big business," following perhaps the example set by Germany and other countries, yet they must all remember that while big businesses were wonderful, they were only made in many instances by

the building up of small businesses in the first case. Whilst they welcomed a strong and leading company in any section of business and a massing of interests, yet he thought they all agreed that a great deal depended upon the management of that company and the attitude adopted by it to the smaller businesses. Sometimes he still had a sort of individualist feeling in his mind, and he hoped that everything would be done to cultivate and encourage not only relations with, but the activity of, the smaller businesses in the chemical trade throughout the country by their big brothers. So far, they had nothing whatever to complain of in that connection.

Dr. Armstrong's Criticism of Patent System

The hon. treasurer (Dr. E. F. Armstrong) said that statistics were an extraordinarily mixed question. On the one hand, they certainly wanted, in dealing with the Government, accurate statistics and information. On the other hand, it was difficult, and often disadvantageous, to give statistics, and the problem for the Association was to try and get a happy mean



DR. E. F. ARMSTRONG, F.R.S.

between those two aspects of the case. There were many difficulties, so that they were placed in this invidious position: that the fuller the statistics, the more accurate they tended to become.

In regard to patents, he said that they all knew the extraordinary number of foreign patents taken out in this country during the past year, and many of them were alarmed at those patents. The patents, for the most part, were not genuine inventions. They were taken out with the object of preventing British manufacturers making or using substances often well known. The day was not far distant when important and far-reaching action would have to be fought on this question of foreign patents. They had in the Association a very important and representative Patents Committee, which had from time to time dealt with general questions. He was going to make the suggestion that the Patents Committee should rather broaden its sphere of action and endeavour to get into touch with individual members and obtain from them information on this particular point with the object of getting cases together and perhaps ultimately seeing whether cases could not be fought. This abuse of our Patent Law could not continue very much longer if British industry was to go forward free and unfettered, as it had every right to. No blame attached to our Patent Office. They were definitely bound down according to regulations and according to the legal interpretation of certain regulations. What they had to do was to get a precedent set up which would enable the Patent Office to alter its methods and ways. He was perfectly certain that the Patent Office would be most pleased to have a precedent which was more in favour of what was the intention in granting a monopoly under a patent. He believed that was a field of work in which the Association could do much during the next year or two.

Lastly, he thought that those of them who had their ears to the ground could hear the distant rumbling of the drums of battle; he was certain that the next chairman was going to live through very critical days in connection with two measures which affected many of them in the room. The general election might or might not mean a change of Government, but, at any rate, it would mean a hesitation and an indecision in action towards certain problems, particularly those problems of safeguarding and the renewal of the Dyestuffs Act. It was unfortunate that problems of real national importance, which ought really to be the subject of a referendum and impartial national attention, should be the subject of party politics. But that was our system, and we had to make the best of it. But it was quite obvious that whatever the Association had done in the past, and however strong they were to-day, that strength was going to be wanted to the very last ounce to fight the very difficult battles in front of them, because, however proud they were of their achievements, they knew that they still required such assistance as those two measures, either in their present or some modified form, could give them. He was quite certain that the efforts of all members of the Association and of the Council would have to be very steadfastly and unitedly directed towards seeing that they at least got the minimum security in the future. Therefore, he felt that if any justification was required for the continuance of the Association, they could say to-day more than ever that the Association was necessary.

Mr. Dawson said that he wished to accentuate and emphasise the speech made by Dr. Armstrong, and to appeal to Sir Max Muspratt, when he next went to Geneva, to emphasise the necessity for the Safeguarding of Industries Act, and especially for the protection of the dyestuffs industry.

On the motion of Dr. P. C. C. Isherwood, seconded by Mr. N. N. Holden, Messrs. Feasey and Co. were re-elected auditors for the ensuing year.

The reception of the general manager's report on the nominations for Council and for Group Committees and a vote of thanks to the Chairman concluded the business.

Chemical Appointments

To the Editor of THE CHEMICAL AGE.

SIR,—Readers of the *Chemical Practitioner* will be aware of the greatly increased facilities of the Appointments Bureau of this Association. At its inception the Bureau was able to do little more than abstract from the various journals particulars of appointments which were thus available to members in a convenient form. Of late, however, it has been our experience that increasing numbers of employers approach the Association direct, so that they may be put in touch with suitable applicants.

For many years, it was only very occasionally that appointments for members were obtained in this way, but an excellent indication of the advance made of late is to be found in the fact that during the last six months fourteen direct applications have been made to the Bureau, ten of which, at least, have resulted in the employment of a member of the Association; in the case of the other four, positive information is not yet to hand. Many employers recognise the advantage of filling a post by this means, since a society which includes chemists with every type of experience and qualification is often able to give employers detailed information difficult to extract from the mass of correspondence which descends with incredible rapidity upon those who advertise for technical assistance.

On the other hand from the chemists' point of view the Bureau possesses facilities which it requires no imagination to realise. One item of our experience may, however, be of interest. The Association has always insisted that an experienced chemist is worth, and ought to receive, a good salary, and it has not been our experience that employers are indisposed to listen. So that not only has the Bureau been able to fill many vacancies but it has further been able, in many cases, successfully to press the case for satisfactory remuneration, to the advantage of both parties.—Yours, etc.

H. T. F. RHODES,
General Secretary, British Association of Chemists.
"Empire House,"
175, Piccadilly, London, W.1.

Nitrogenous Fertilisers in Australia.

An Analysis of Possibilities

A great increase in the use of ammonium sulphate and other nitrogenous fertilisers in the various countries of the British Empire would probably be of considerable importance to the nitrogenous fertiliser industry. In what follows, an "inside" account of the situation in Australia is given by a correspondent of the "Industrial Australian and Mining Standard."

INTEREST is again being manifested with regard to the possibilities existing in Australia for an increase in the consumption of nitrogenous fertilisers. Only a few weeks ago, an important commission, consisting of three technical members of the staff of Imperial Chemical Industries, Ltd., completed a survey of Australia from the standpoint of its nitrogen requirements, and it is understood that they were favourably impressed with the prospects. Whether their recommendations, based on their observations, will lead to any attempt to produce nitrogenous fertilisers and allied products on a scale large enough to be economically feasible is still in the realms of speculation, but a general, if brief, survey of the position as it at present exists will be an interesting aid to its consideration.

Electrolytic Zinc. Co. Developments

In this connection, the recent remarks of Mr. W. L. Baillieu, the chairman of the Electrolytic Zinc Co., are of more than ordinary interest. Nitrogen fixation, he asserted, is definitely a part of the company's programme, and he further mentioned that his company could control the technical knowledge and experience necessary to success. He believed that the Electrolytic Zinc concern was destined to play a big part in the manufacture of chemicals and fertilisers, particularly those obtained by the medium of the processes available for utilising the nitrogen of the atmosphere. Certainly, tremendous success has attended the establishment of this industry in European countries where the demand for nitrogenous fertilisers is a *sine qua non*, owing to the exhaustion of the soil and the methods of cultivation. When it is noted that the production in Germany alone will amount to approximately 700,000 tons of pure nitrogen during 1928 (equivalent to 3,500,000 tons of ammonium sulphate, though not all produced as such), the magnitude of this war-stimulated project is apparent.

It might be well to mention that nitrogen is one of the most remarkable of all the ninety elements so far discovered. As a gas, comprising some four-fifths of the atmosphere, it is comparatively inert, but once it enters into combination with other elements, it displays the greatest activity both in the organic and inorganic fields. The greatest demand for nitrogen now comes from the fertiliser industry, which accounts for approximately 90 per cent. of the total nitrogenous chemical products manufactured. The second, though far less important outlet in peace time, is in the production of explosives, for these products almost invariably contain nitrogen in one form or another, and owe their remarkable properties to it. Thirdly, the use of nitrogen enters into the manufacture of dyestuffs; not perhaps on a very large scale as regards tonnage, but nevertheless exceedingly important. Another outlet for the use of nitrogen in the form of ammonia is in refrigeration, and the developments proceeding all over the world in this direction indicate the future utilisation of nitrogen in increasing quantity.

The Sydney Proposal

Australia as a potential user of nitrogen fertilisers has attracted attention before, and a little over two years ago it was publicly announced that manufacture was to be undertaken in the neighbourhood of Sydney, ostensibly by utilising the Haber process now operating with such success in Germany. The company responsible for the new enterprise was the Nuske Power, Fuel and Nitrogen Co., Ltd., an Anglo-German concern. Precise details were given at the time as to the site selected for the works, and it was stated that the first unit would give employment to 3,000 men, the ultimate object being the erection of 10 units of similar size. In addition to the production of nitrogenous fertilisers, it was announced that the company would proceed with the manufacture of motor fuel on a large scale. The names of several Sydney business men were associated with the idea, and with a new company to be formed to acquire land and build garden villages for the employees in the vicinity of the factory.

Inquiry has failed to find any sign of development in connection with this very ambitious scheme. The output of even the first unit of such a factory as that planned, if to be sulphate of ammonia, would have been three or four times, at least, the present consumption of nitrogen in Australia. Since 10 such units were projected, it could only be that the foundation interests, probably entirely German, were considering the advisability of establishing a centre of production as near to the great potential markets as conveniently possible. Java is already a large consumer of sulphate of ammonia—well in excess of 100,000 tons—and other parts of the East Indies and Malay States are susceptible of equal development in this connection. Further, there are the enormous possibilities inherent in India and China, countries in which the land has been tilled and retilled for centuries, and where the application of nitrogenous fertilisers would being about extremely profitable results if the agriculturist could be educated to their use, and financially assisted also. Japan, too, which uses some 300,000 tons of ammonium sulphate, has to import half this quantity, and will doubtless need more as the story of its successful application travels.

The Trend in Manufacture

But since the earlier days of the industry from 5 to 10 years ago a change has taken place in certain aspects of nitrogenous fertiliser technology. The German interests, now merged in the I. G. Farbenindustrie A.-G., which have pioneered in this branch of applied science, have concentrated on the manufacture of what are termed the higher-analysis fertilisers, in which there is contained far more of the actual fertiliser element in a given quantity of the product. The two best known nitrogenous fertilisers, sulphate of ammonia and nitrate of soda, contain respectively 20 per cent. and 15 per cent. of nitrogen.

On the European and American markets, however, there have been sold, and with considerable success, materials such as ammonium sulphate-nitrate, containing 26 per cent. nitrogen, and urea, with 46 per cent. Further, work has been done in order to produce chemically-mixed fertilisers containing not only nitrogen, but one or both of the other essential elements required by agriculture, namely, phosphoric acid and potash. Ammonium phosphate is an example of the former, and a product now being marketed is di-ammonium phosphate, containing 20·6 per cent. of nitrogen and 52·5 per cent. of phosphoric acid, all water-soluble. It is of especial significance that urea and di-ammonium phosphate (known as diammon-phos, and also as "Floraphos") have come on the market in Australia. They were registered under the Fertilisers Act last year by Dyes and Chemicals, Ltd., the Australian agents of the I. G. Farbenindustrie A.-G.

Both these products contain nitrogen in the same form as that found in ammonium sulphate (not exactly the same in urea, but near enough for ordinary purposes), and consequently have been considered as substitutes for that product, which is subject to an import duty of 25 per cent. (15 per cent. U.K. preferential rate). An unsuccessful effort was made in the Australian House of Representatives in September last to have diammon-phos transferred to the "fertilisers n.e.i." schedule, thus making it free of duty, on the ground that it contained phosphoric acid. Its high concentration makes it very suitable for market-garden and horticultural work, and at £37 10s. per ton it is unlikely to reach other markets while home produced ammonium sulphate (20·59 per cent. nitrogen) is selling at £15 5s. per ton, and superphosphate (24 per cent. phosphoric acid, of which 22 per cent. is water-soluble) is priced at £5 10s. It is interesting to notice that the term "Floraphos" can only be used for this material when sold in lots of less than one cwt.

"Complete" Fertilisers

The latest, and in some respects, the most interesting development in recent fertiliser technology is the production of a chemically-mixed "complete" fertiliser containing the theoretical maximum of essential elements, and destitute of any filler material which might exercise any harmful effects. The

credit for this work belongs without question to the German investigators, and the manner of its inception is not only interesting, but significant. China, with its enormous population and well-worked soil, offers a very attractive proposition to the fertiliser producer. Starting from the premise that no help was to be gained from the soil, a product was evolved containing 13 per cent. of nitrogen, 10 per cent. of phosphoric acid, and 13 per cent. of potash—a mixture in which the elements were believed to represent the best ratio for the average plant's requirements. This was announced in 1926, but since then a new type has been put on the market under the generic name of "Nitrophoska."

Up to the present moment, five varieties are being made by the I.G. concern, one of which has found its way to Australia within the past month or two. Its acceptance and registration as a fertiliser suitable for this country have only just been effected by the company previously referred to. The composition is as follows:—Nitrogen 16·5 per cent., phosphoric acid 16·5 per cent., and potash 20 per cent. As the Customs Department are of opinion that this material does not constitute a substitute for sulphate of ammonia, it is to be admitted free of duty. With the price at £23 10s. per ton, and its concentrated nature making transport charges, particularly in a country of distances like Australia, much less onerous in proportion to its quality, there would appear to be more opportunity here, provided the user can be educated to employ what at first sight appears to be an expensive fertiliser. It is stated that Imperial Chemical Industries, Ltd., through their subsidiary, Synthetic Ammonia and Nitrates, Ltd., in England, are preparing to manufacture all these, or similar products, as soon as possible.

A Pertinent Query

But is there really an outlet for a considerable increase in the production or importation of nitrogenous fertilisers in Australia? The Australian Sulphate of Ammonia Propaganda Committee, which has performed a considerable amount of educational work amongst agriculturists, is not yet able to report that consumption has approached to within appreciable distance of production. Using approximate figures, the progress made can be best shown by the fact that in 1918 production amounted to 12,000 tons and home consumption to 4,400 tons: by 1924 the respective figures were 16,000 tons and 10,700 tons, the latter representing a steady increase of roughly 1,000 tons a year. In 1927 the figures were 18,300 tons and 14,000 tons. A small proportion of this quantity, and a gradually lessening one, is in the form of ammonium compounds other than the sulphate. In the past three years production has advanced by 2,000 tons and consumption by 4,000 tons, and this is reflected in the export figures, which fell from 7,000 tons in 1925–26 to 5,000 tons in 1926–27. Half of the exports go to Japan, and most of the remainder to Fiji. Possibly a further contribution to the total output will result from the developments now taking place in the iron and steel industry.

It is interesting to notice the efforts being made, in spite of the lack of competition, to produce a high-grade neutral sulphate of ammonia in Australia. In European countries, the appearance on the market of the synthetic product made by the fixation of atmospheric nitrogen, which is an excellent acid-free material of good texture, simply forced the manufacturers of by-product sulphate to improve the quality—or fight a losing battle in the world's markets. Thus the Australian farmer is able to secure a first-class product to take care of his requirements in regard to nitrogen, and entirely of domestic origin. Nitrate of soda, a Chilean product containing nitrogen in a form rather different from that in which it is found in sulphate of ammonia, is not making any headway in Australia, and the propaganda delegation was withdrawn only last year.

An explanation as to why a country depending to so large an extent upon primary industries, such as agriculture and sheep-raising, does not appear to need any large quantity of nitrogenous fertilisers is given by Dr. A. E. V. Richardson, of the Waite Agricultural Research Institute, South Australia. The fundamental principle underlying the Australian practice of bare fallowing, he says, is that it conserves soil moisture, and leads to the rapid nitrification of the organic matter. In a locality having a rainfall of under 20 inches per annum, bare fallowing is essential, for no combination of artificial fertilisers can make up for a deficiency of soil moisture. The dry conditions existing over a great part of the wheat belt also mean that the considerable losses of nitrogen by leaching such as occur in European countries do not take place in Australia, while the system of cropping is not as intensive as that of Europe. In the wetter districts a limited call for nitrogenous manures exists, and this may be expected to develop as cultivation becomes of older date. Whether the interest now being directed to the top-dressing of pastures with superphosphate, with such successful results, may lead agriculturists to try nitrogen also in this field of application remains to be seen. Certainly the question is being discussed with considerable animation in European circles, and there appears to be no reason why this aspect should not receive consideration in Australia.

Society of Glass Technology

International Meeting at Aachen

THE last meeting of the session of the Society of Glass Technology, held recently, was devoted mainly to reports of the proceedings of the recent joint meeting at Aachen between the Society of Glass Technology and the Deutsche Glastechnische Gesellschaft. This meeting, which was stated to have been the first occasion in which a British and a German scientific society had met on German soil since the war, occupied three days, namely, May 22–24, and was marked by very generous hospitality on the part of the civic authorities and prominent local glass manufacturers, particularly of Messrs. Bicheroux and of the Stolberg Works of the St. Gobain Co.

The technical proceedings occupied two days. The first was devoted to joint committee work, presided over the first part by Prof. G. Gehlhoff, Vice-President of the Deutsche Glastechnische Gesellschaft, the second part by Prof. W. E. S. Turner. Questions of methods and standards were the subject of consideration in three fields of glass technology, namely (1) Physical and chemical measurements on glass with special reference to the subjects of thermal expansion, viscosity and chemical durability; (2) The physical properties of glasses suitable for manipulation by automatic machinery; and (3) Modern developments in refractory materials suitable for the glass industry. After the proceedings in committee, it was decided that a standing committee composed of representatives of each of the two societies should be appointed to continue the discussion of the proposals formulated during the day and to make recommendations in regard to standards.

May 23 was devoted to an 8-hour sitting for the reading and general discussion of papers. Four were read on behalf of members of the Deutsche Glastechnische Gesellschaft, and four by members of the Society of Glass Technology, the papers being as follows: "The Glass Melting Furnace as a Heat Engine," by Professor Dr. D. Aufhäuser, of Hamburg; "The Thermal Expansion of Glass and the Question of the Determination of Annealing Temperature," by Professor W. E. S. Turner, of Sheffield; "The Velocity of Crystallisation of Soda-Lime-Silica Glasses," by Professor Dr. E. Zschimmer, of Karlsruhe; "Expansion and Tensile Tests on Glass House Refractories," by J. F. Hyslop, R. F. Proctor and H. G. Biggs, of the Research Laboratories of the General Electric Co., Ltd; "The Physical Properties of Clays," by Professor Dr. G. Gehlhoff, of Berlin; "The Influence of Cullet in Glass-Making Operations," by Professor W. E. S. Turner, of Sheffield; "The Amount of Gases and of Water Contained in Glasses," by Dr. Ing. H. Salmang, of Aachen; and "The Annealing of Glass from the Point of View of Factory Operation," by E. A. Coad-Pryor, of London. Nearly 60 British members of the Society of Glass Technology made the journey to Aachen. A number of members of the Society resident in Holland, Belgium, France and Spain also attended.

The Thomas Recording Gas Calorimeter

THE issue of THE CHEMICAL AGE for June 2 (p. 524) contained a note on the report recently issued by the Fuel Research Board with regard to tests carried out on an early form of the Thomas Recording Gas Calorimeter. The Cambridge Instrument Co., Ltd., now state that after making tests on one of the later instruments, the Gas Referees are prepared to prescribe the calorimeter for use in official testings.

The Development of Chemical Export Trade

Danish and Norwegian Requirements

THE Danish demand for chemicals is extensive, and the market offers useful business possibilities for United Kingdom manufacturers. Various industrial concerns call for considerable quantities of both fine and heavy chemicals, whilst the agricultural industry is responsible for a very large importation of chemical fertilisers and artificial manures. Great Britain has succeeded in securing a fairly satisfactory share of the trade in certain directions, but continental countries, more particularly Germany, have established a firm footing in the market. Moreover, exports from the United Kingdom to Denmark during 1926 show a decided decrease compared with the previous year, and every effort should be made by British firms to improve their present position.

Danish Chemical Imports

The following table indicates the total importation of the more important classes of chemicals and chemical fertilisers into Denmark during 1925 and 1926 :—

	1925. Metric Tons.	1926. Metric Tons.
Soda, ordinary calcined	12,499	13,316
Raw phosphate	126,832	152,097
Superphosphate	147,343	165,635
Lime nitrogen fertilisers	1,419	524
Potash fertilisers, 20 per cent. and under	245	1,045
Potash fertilisers, 37 per cent.	45,518	54,382
Potash fertilisers, other	429	26
Norwegian saltpetre	76,127	73,825
Chili saltpetre, etc.	55,952	37,056

Exports from Great Britain to this market during those years were :—

	1925.	1926.
Chloride of lime	cwt. 14,708	cwt. 8,080
Red lead and orange lead	,, 7,479	,, 6,262
Sodium compounds	,, 52,526	,, 52,716
Zinc oxide	,, 4,920	,, 194
Other chemical manufactures	£14,485	£11,314
Proprietary medicines	£5,136	£4,795
Drugs and medicinal preparations	£10,592	£10,126
Finished dyestuffs	cwt. 218	cwt. 174
Painters' colours and materials	,, 9,829	,, 14,231

Competition in Heavy Chemicals

With regard to heavy chemicals, the most severe competition emanates from German, Belgian, French and Italian manufacturers, whose success has been achieved mainly by reason of their ability to quote low prices. Great Britain, however, enjoys an appreciable share of the trade in caustic soda and calcined light alkali, although Germany and Belgium both export larger quantities of the former than United Kingdom firms. Calcined light alkali is also imported from Belgium. Copper sulphate is obtained in more or less equal quantities from Germany and the United Kingdom, whilst potash and acetic acid are almost exclusively drawn from the former country. The demand for fine chemicals, used principally for pharmaceutical purposes, is exceedingly good, but here again German manufacturers, by reason of their more attractive quotations, have secured the largest share of the trade.

The local woollen, cotton, silk and artificial silk industries consume heavy quantities of dyes and dyestuffs, but imports of these preparations from the United Kingdom are negligible. This branch of the chemical trade is also successfully catered for by German manufacturers, whilst a similar position prevails with respect to tanning materials.

As Denmark is essentially an agricultural country, the market for chemical fertilisers is a very important one. Phosphates and superphosphates are the main fertilisers imported, while the demand for sulphate of ammonia, basic slag and other artificial manures is also good. Imports from Great Britain, however, are mainly confined to superphosphates, and even in this direction imports from the United Kingdom total only about 1,000 tons per annum. The recent depressed conditions of the agricultural industry have forced Danish farmers to purchase the cheapest materials possible, and price is therefore a most important factor at the present time. It is also essential that superphosphates intended for this market should contain a sufficient percentage of water-soluble phosphoric acid as to respond to the needs of Danish soils.

British chemical manufacturers should generally be well able to increase their sales in Denmark, but if this is to be accomplished a closer study of the market's requirements must be made. Efficient representation and the adoption of wider publicity are essential details which must receive adequate attention.

The Norwegian Market

Norway is another useful market for the sale of chemicals and chemical preparations, and one that deserves more careful cultivation by British manufacturers. The total importation of the more important chemicals into this market during 1925–26 is shown in the following table :—

	1925. Kilos.	1926. Kilos.
Glauber salts	13,491,100	10,069,288
Soda ash	26,173,840	27,122,391
Caustic soda	2,320,540	1,620,261
Sulphur and flowers of sulphur	15,541,570	14,694,119
Sulphuric acid	47,430	398,336
Thomas phosphate	19,791,310	14,942,908
Superphosphate	22,019,210	25,802,570
Rock phosphate	5,930,240	4,238,980
Kainite and other potash fertilisers	19,243,570	17,838,003

As in the case of Denmark, the keenest competition, both in fine and heavy chemicals, is provided by Germany and Belgium, while Holland also enjoys a fair share of the trade. Exports from Great Britain are mainly confined to ammonium compounds, sodium compounds, red lead, orange lead, proprietary medicines, medicinal preparations, and painters' colours and materials. The local production of chemical fertilisers is carried on to a large extent, and requirements of nitrates are mainly satisfied by domestic products. Superphosphates are principally obtained from Germany, Holland, Belgium, and, to a lesser extent, from Great Britain, whilst Thomas phosphate is purchased from Holland, Belgium and France. Kainite and potash fertilisers are supplied chiefly by Germany. The high prices demanded for British fertilisers provide a handicap to increased business, and every effort should be made to bring quotations to a more competitive level.

Prompt shipment is also a vital factor in connection with the chemical trade of this country, as German firms are in a naturally favourable position to give quick deliveries.

Analytical Chemist's Accident

LORD ORMIDALE and a jury, in the Glasgow Court of Sessions, on Monday, heard evidence in an action by John Sinclair, analytical chemist, of 42, Airlie Gardens, Hyndland, Glasgow, against Bilsland Brothers, Ltd., bakers, of 75, Hydepark Street, Glasgow, for payment of £2,000 as damages for personal injuries. On the afternoon of Saturday, October 15, 1927, the pursuer was riding a motor cycle across the opening of Elderslie Street, on the south side of St. Vincent Street, when a heavy motor van belonging to the defenders, and driven by a servant, suddenly and without warning cut across St. Vincent Street towards the south-west corner of Elderslie Street, and ran into the pursuer's motor cycle, throwing the pursuer and damaging his motor cycle. The pursuer's right knee-cap was smashed, causing permanent physical disability and adversely affecting his professional career. The defenders denied fault, and pleaded contributory negligence. They stated that their driver was compelled to turn his van to the wrong side of Elderslie Street because of a pedestrian who was crossing the street. While the van was in this position they averred that the pursuer came along St. Vincent Street at an excessive rate of speed and accelerated his engine for the purpose of passing in front of the van. The driver applied the brake of the van to allow the pursuer to clear, but his right knee struck the dumb-iron or some other part of the van, with the result that he was thrown on to the street. The jury, after an absence of 40 minutes, returned a unanimous verdict for the pursuer, and assessed damages at £250. It is understood that a tender of £300 and expenses had been previously made by the defenders.

Gas Light and Coke Co.'s New Research Laboratories

Opening by Sir Richard Threlfall

On Thursday, the new chemical research laboratories of the Gas Light and Coke Co., at the Fulham works, were opened by Sir Richard Threlfall, F.R.S. An account of the new laboratories appears below.

Of the new research laboratories of the Gas Light and Coke Co., at Fulham, No. 1 laboratory, on the first floor, occupies a floor space of about 2,700 sq. ft., and will be used exclusively for general chemical research. Less than the usual proportion of floor space has been filled up with fixed benches so that movable tables may be arranged to suit the requirements of any particular apparatus. Adjacent to this laboratory there are a balance room, offices, and cloak room. On an upper mezzanine floor there is a conference room and library, with accommodation for about 4,000 books. No. 2 laboratory, on the ground floor, will be kept as free as possible from fixtures and reserved for technical and semi-large scale work. There is an ample provision of flue outlets concealed in the walls, and the usual gas, air, vacuum, water and electric services are available just above head level.

No. 3 laboratory will be used partly for research and partly for the chemical control of the operations carried out at the Fulham works. On a mezzanine floor there is an office overlooking No. 3 laboratory.

In the basement there are five store rooms (some of which may be converted ultimately to small laboratories, if necessary) and also an optical laboratory, a photographic dark room, a thermostat room, in which trials are being made of new recording calorimeters, a compressor room, in which gas and air compressors and a vacuum pump are installed, a power room, in which are fitted the main electrical switches and a motor converter for the supply of low voltage current to the laboratories for electrolytic work, a furnace room with central heating apparatus, and a cloak room.

There is a special entrance at the back of the laboratory for goods, which are delivered on to a lift whereby they may be conveyed to the basement or to any of the upper floors. All the main benches in the laboratories are so constructed that one half may be pulled away to expose all the service pipes and drains. The services comprise high and low pressure gas, coal gas for testing purposes (as distinct from the mixture of coal gas and carburetted water gas), compressed air, vacuum, water, steam and electric power at 220 and 215 volts d.c. Service pipes are painted in different colours and fitted with differently designed cocks to aid in identification. The provision of a workshop for making experimental apparatus has been deferred until the second half of the buildings is erected. Meanwhile, the resources of the Fulham workshops adjacent to the laboratories are available together with those of other special workshops of the company.

Research Work of the Company

Chemical work on the manufacture of gas has developed steadily since Frederick Accum, "Practical Chymist," was appointed a director of the company in 1812, and the opening of the new laboratories at Fulham marks a further stage in this development. The new laboratories have been erected to permit an extension of the research in connection with the manufacture of gas which has been proceeding at each of the company's thirteen gas manufacturing stations and in smaller laboratories at Westminster and Tudor Street.

Although high temperature carbonisation has now been practised for so many years, the various processes of manufacture and purification are still capable of improvement, and there are many reactions involved in high temperature carbonisation of whose mechanism our knowledge is not sufficiently exact. It is to the investigation of these that the research work in the new laboratories will be primarily directed, as also to study of the structure and composition of the coke, tars and other residuals which may enable the processes of manufacture to be so modified as to produce more suitable qualities of these residuals.

At the same time, there is certainly much of interest in the development of the various processes of low temperature carbonisation, and, in particular, much work remains to be done in connection with the tars and semi-cokes produced by these processes. The staff at Fulham will also be very closely connected with the results obtained from, and the experiments conducted in, the plant now being erected at Richmond as a result of discussions with H.M. Government, the Department of Scientific and Industrial Research and others, and the two other smaller units of low temperature plant which have been erected by the company.

Experimental Carbonising Plant

There are many problems which can only be satisfactorily investigated on the full works scale, and the study of the chemical reactions likely to affect the design or method of working of the various types of high temperature carbonisation plant will be greatly facilitated by the experimental carbonising plant at Fulham, which will permit of quantitative work being carried out under normal working conditions. This plant consists of a train of condensers, washers, and purifiers leading to a common inlet to a pair of gas meters.

The Carbonisation of Coal

Further improvements in connection with high temperature carbonisation processes are, as has been suggested above, frequently hampered by our lack of fundamental knowledge regarding the mechanism of the chemical reactions involved. With the object of acquiring this knowledge, the company began a few years ago to study the thermal decomposition of hydrocarbons. Methane is the most important constituent of coal gas from a thermal point of view, and chemically, it is one of the simplest and most stable hydrocarbons, yet its decomposition, which is known to take place under conditions of modern carbonisation, has not been previously examined quantitatively in any detail. As a preliminary to a study of the rate of decomposition, it has been necessary to re-examine the equilibrium between carbon, hydrogen and methane, since it has been found that the hydrogen produced by the decomposition exerts a retarding effect, depending mainly upon the nature and extent of the hot surface to which the gases are exposed, and that there exists what can only be regarded as a state of false equilibrium.

Large Scale Investigations

During recent years, the gas manufacturing plant at several of the works has been utilised by the research staff for the investigation of a variety of problems, and it is intended that this type of large scale work shall continue in close collaboration with work carried out on a smaller scale, but with greater refinement, in either the experimental plant or the research laboratory. As an example of the study of carbonisation on the large scale, it may be mentioned that special attention has been paid to the increased output of gas from vertical retorts which may result from either blending and briquetting or screening coal prior to its carbonisation.

The By-Products of Coal Carbonisation

Although the staffs in the laboratories attached to the gas works are not concerned with the manufacture of finished products from the crude tar, liquor, and spent oxide, it is found that a study of the properties of the by-products is essential to the elucidation of coal carbonising problems, since the nature of the products is determined very largely by the exact details of carbonising conditions. In this connection a study has been made of the relationship between carbonising conditions and the free-carbon content of tar.

The combustibility and other general properties of coke produced under different conditions have been studied in order to determine the influence of carbonising conditions upon those properties, and in order to determine the most suitable grade of coke to be supplied for use by consumers in different types of appliances. Apparatus has been devised for the combustion of coke under conditions which may be controlled and ascertained.

Low Temperature Carbonisation

As already stated, a low temperature carbonisation plant, designed by the Fuel Research Board, is being erected at the company's gas works at Richmond. This plant will have a capacity of 100 tons of coal per day. In connection with it, a unit of the Hird type of retort is also being erected which will deal with small coal.

Adjacent to the experimental carbonising plant at Fulham, a Salermo low temperature retort has been erected to enable the company to study the suitability of this type of continuously operated plant for dealing with various kinds of English coals. It is hoped that a careful study of the results obained from these several plants will yield information valuable, not only to the company, but to the whole of the coal-treating industries. Naturally, the tars resulting from the low temperature carbonisation of different coals will be the subject of considerable attention in the research laboratory.

Miscellaneous Activities

During the past four years, considerable attention has been paid in several of the works laboratories to the extraction of benzol from coal gas by means of activated carbon. It was found, however, that in contact with coal gas the activity of the carbon diminished at such a rate that the cost of replacing it was excessive. Experimental work is proceeding in connection with these matters, and also a large scale plant is being erected at one of the company's works.

General interest in all questions associated with ammoniacal liquor has been stimulated, not only by a realisation of the necessity for making a stronger liquor so as to economise in transport and distillation charges, but also by the difficulties experienced in certain localities in connection with the disposal of effluent liquors.

The well-known process of removal of hydrogen sulphide from gas by means of iron oxide is cheap and efficient, but it suffers from the defect that it occupies a considerable amount of ground space. With the steady growth in the output of gas from the company's works, this is becoming a serious consideration, and it is proposed to make further laboratory studies of several processes which may lead to an economy in ground space.

The company's research and routine chemical work is not limited to that already described. The conversion of the residuals into various marketable chemical products is continuously studied in the laboratories at the by-products works at Beckton, by a special staff of chemists, while problems of gas consumption are studied at special laboratories at Watson House, Nine Elms, and at the industrial apparatus workshops in the city. The company's interest in gas chemistry has also been expressed by a close contact with the work of the Universities. The gas industry, as is well known, is closely connected with the work of Professor Cobb at Leeds University, where an experimental plant has been erected in memory of the late Sir Corbet Woodall, formerly governor of the company. A research fellowship has also been endowed by The Gas Light and Coke Company at Imperial College, London University, and, under the inspiration of Professor Bone the holders of this fellowship have carried out much interesting work. The company are also closely connected with Professor Bone's work on high pressure reactions. Only last year the directors joined with Imperial Chemical Industries and others to endow and support new chemical engineering laboratories for University College, London.

Road Tar and its Uses in Great Britain

By W. E. Cone

Below we give some extracts from the comprehensive paper on "Road Tar and Its Uses" presented by Mr. W. E. Cone at the recent Tar Conference held in Paris under the auspices of the French Tar Producers and Distillers' Association.

Coal Tar—the earliest of all modern road surfacing materials—has made possible in Great Britain the construction of highways which are looked upon as a model by the whole civilised world. The production of coal tar in Great Britain is about 2,000,000 tons, and is derived from the gas and coking industries in the approximate proportion of 1,350,000 to 650,000 tons respectively. As an indication of the extent to which the preparation of road tars is increasing, it is estimated that the output in 1923 was 450,000 tons and, in 1927, 700,000 tons, an increase in five years of 55 per cent. It is also interesting to compare the importation of asphalt and bitumen into Great Britain over the same period, the quantities being 262,871 and 260,640 tons respectively.

The general trend of policy on the part of highway authorities in Great Britain is towards the adaptation of their roads to the requirements of modern traffic by the use of tar, either as a surface dressing or road-surfacing material. Surface dressing with tar has now come to be regarded as an essential procedure in the efficient and economical maintenance of all waterbound roads carrying motor traffic, with the object of providing a waterproof crust and thereby preventing disintegration of the surfaces by traffic in wet weather. Tarmacadam is no less popular as a surfacing material for the construction of new roads, and the hundreds of miles of tarmacadam roads throughout the length and breadth of Great Britain testify to the success that has attended this material since its inception.

In dealing with the criticisms directed against tar, it should not be overlooked that these have been largely brought about through the injudicious selection of tar, and the lack of knowledge of its use for a specific purpose. It is not uncommon in Great Britain to-day to find crude or other inferior tars being used for the spraying of roads, and, worse still, to find them devoid of any gritting material. From this it is not difficult to foresee complaints arising from motorists and other road users with regard to the "bleeding" of the surface in summer weather, and the subsequent splashing occasioned by the passage of vehicles over the road. The answer to this complaint is to be found on all roads where tarspraying has been carried out in accordance with the best practice. Given a tar of the right viscosity, and otherwise conforming to specification, whose application has been made in the correct manner with adequacy of gritting, immunity from the evil referred to is assured.

The same reasoning is applicable to the complaints directed against tarmacadam with regard to its alleged incapacity for withstanding heavy traffic conditions. Where failures take place they can invariably be traced to one or more of the following causes:—(1) Inadequacy of foundation. (2) Imperfections in the aggregates and poor grading. (3) Inferior tar. (4) Faulty construction.

The much-debated question of the toxic effect of tar on fish life is one that has been grossly exaggerated. While it is not intended to convey the suggestion that road tar has not been responsible for the pollution of fishing streams, investigation has shown that careless conditions of laying and unusual climatic conditions have played their part in bringing this about. This much can be said for tar, that increasing viscosity means decreasing toxicity, and, assuming the proper precautions are taken to select the best quality tar and its application is made under the best conditions, the risk of pollution becomes very small.

The advantages it possesses as a road-making material can be summarised as follows:—(1) Low initial cost. (2) Minimum maintenance charges. (3) Ease of application. (4) Durability. (5) Resiliency. (6) Permanent non-skid surface. (7) Dustless and waterproof.

The inception of the British Road Tar Association, an organisation representative of the tar producers and tar distillers of Great Britain, has made a fuller recognition of the claims and merits of road tar possible by engaging in propaganda of various forms. The necessity for such an Association became apparent a few years back in view of the lack of cohesion amongst the tar interests, and the growing competition of other highly subsidised road-making interests. An extensive publicity campaign has been carried out through the medium of the technical press, and advantage has been taken of other media for advertising.

In dealing with the possibilities of the future, one is forced to the realisation that road-making is rapidly developing from an art to a science, and rule-of-thumb methods will have to be eliminated altogether. The technique of modern road-making to-day is advancing at such a rate that without the requisite knowledge of the physico-chemical principles under-

lying the use of his materials, the road engineer is at a loss in determining their effectiveness in practical use. The many advances that are being made by the tar producer and distiller in the preparation and quality of the material demand that equal progress should be made by the road engineer in its utilisation. It may be, of course, that the road engineer has not the same facilities or time to give a closer study to the intricacies of the contemplated work, but there would appear to be no reason why all parties should not get together and co-operate in the problems that confront them.

The future of tar for road-making is a dual responsibility, and rests with the engineer and chemist: its future advancement will only be brought about by their collective efforts, and it would seem unnecessary to urge both the tar producer and distiller to see that facilities are given whereby this can be achieved. Another equally important factor is the transport and distribution of tar over the road. The transportation of large quantities of this material necessitates that advantage should be taken of improved methods. In this respect, several interesting types of vehicles are being utilised in Great Britain. These tar tankers have a capacity up to 2,300 gallons and are equipped with steam coils or lagged to maintain the temperature of the tar, and are fitted with pumps for filling and discharging. The old method of distributing tar over the road by manual labour is also rapidly being supplanted by machines specially devised for the purpose. Many of these machines are designed for tar spraying and gritting to be carried out in one operation, which considerably facilitates the surface dressing of roads.

The object of this paper has been to portray the development and stability of the road tar industry in Great Britain. Linked up with this are other great industries, the combined capital of which runs into millions of pounds, and gives employment to hundreds of thousands of men.

The enormous developments which have taken place since the introduction of tar as a road-making material pay a striking tribute, not only to its merits, but to the early pioneer workers who paved the way for its subsequent widespread use. The past achievements should be sufficient heritage upon which to build an even greater future, and prepare the way for further advances.

The author wishes to thank Monsieur Bing and the French Tar Producers and Distillers' Association for their kind invitation to give this paper, and also to thank the President (Sir David Milne-Watson) and Members of the Managing Council of the British Road Tar Association for permission to deliver it.

Low Temperature Distillation Tests

Commercial Plant to be Erected

MOTOR FUEL PROPRIETARY, LTD., announce the following results of some recent tests made at their commercial production plant at Slough, which is capable of treating ten tons of coal a day.

NOTTINGHAM COAL TREATED: 7 TONS 14 CWTS.

	Tons.	Cwts.	Qrs.	Lbs.	
Crude oil	0	16	3	27	11·0 per cent.
Residue	5	6	0	0	68·8 ,,
Water	1	9	0	26	19·0 ,,
Gas and loss	0	1	3	3	1·2 ,,
	7	14	0	0	100·0 ,,

Crude Oil produced—230 gallons or 30 gallons per ton.

LANCASHIRE CANNEL COAL: 8 TONS 17 CWTS.

	Tons.	Cwts.	Qrs.	Lbs.	
Crude Oil	2	15	0	10	31·1 per cent.
Residue	4	12	0	24	52·1 ,,
Water	0	10	0	0	5·6 ,,
Gas and loss	0	19	2	22	11·2 ,,
	8	17	0	0	100·0 ,,

Crude Oil produced—720 gallons or 81 gallons per ton.

The directors have decided that their process can now be operated commercially, and have acquired a site in the Nottingham coalfield for the erection of plant and oil refinery. Orders have already been placed with Ruston and Hornsby, of Lincoln, for the first retort of the new unit of 80 retorts. Negotiations have also taken place with a view to certain leading coal owners joining the board.

Chemistry and Empire Farming

Lord Melchett's Message

IN a message to the Empire farmers at the Royal Show at Nottingham, on July 11, Lord Melchett said: I regret very much that most urgent work connected with the Conference on Industrial Reorganisation and Industrial Relations makes it impossible for me to welcome personally the Empire farmers. The future of Empire agriculture is a problem to which my companies and myself have paid a great deal of attention and thought, and I should like to have indicated what we are doing and what we propose to do to further its development. Imperial Chemical Industries, Ltd. is engaged in developing large scale manufacture of fertilisers, and at Billingham is promoting a great new national industry of the utmost imperial significance. The plant itself is a great triumph of British engineering, and expansion on a large scale is taking place progressively.

We are also engaged in devising forms of fertilisers to suit the varying requirements of soils and transport conditions occurring throughout the Empire. Our aspiration is to co-operate with the farmers of the Empire, who supply such a large and increasing proportion of the food and raw material requirements of Britain, by providing them with fertilisers which will make their crop yields larger and more remunerative.

Interrelation of Agricultural and Fertiliser Industries

The success of the production on a large scale of fertilisers depends upon the agricultural prosperity of the Empire, just as the agricultural prosperity of the Empire depends upon the application of fertilisers. In order to achieve this dual object, Imperial Chemical Industries, Ltd., have established a research station and gathered together a staff of research workers under the direction of Sir Frederick Keeble, an eminent authority on agricultural questions. The results of the work of this station and staff are at the disposal of the farming communities of the British Isles and the British Empire.

As a link and liaison between the farmers of the Empire and the headquarters research staff, the services of Lord Bledisloe, who has such an intimate knowledge of the agricultural problems of Britain and the Empire, are available. Lord Bledisloe, as you all know, is a late Secretary for Agriculture, and is himself a practical and experienced agriculturist. We recognise, of course, that the building up of an agricultural organisation in all parts of the Empire must of necessity be a slow and laborious process. Our aim is to study and provide for the needs of all. The research staff must therefore be representative of the Empire, because, for advice in agricultural matters to be of economic value, it must be specific and not general.

A Great Imperial Edifice

We contemplate the creation of a great edifice which should be both serviceable and enduring. It is natural, therefore, that we shall start our structure in the British Isles, but throughout we shall have before our eyes the needs of the Empire. One of our first steps will be to establish a British agricultural association in order to apply the new principles of grassland management and of applying fertilisers in relation to crop rotations in this country. That association will gradually be extended to other parts of the Empire.

I have, perhaps, underestimated the Empire significance and services of our organisation. Already in Australia we have a productive capacity, and at the present moment a special mission studying the agricultural problems of that great continent. In South Africa, too, we have an associated company which produces fertilisers, arranges their sales and distribution, and is in close touch with the ever-increasing range of agricultural problems and production in that country.

Very fruitful results have already been obtained in this country. I hope that our guests will visit the demonstrations of the new system of grassland management which are being given in different part of the country. They will thus have the opportunity of judging for themselves on the results which have already been achieved. Modern commerce applied to the most ancient and the largest of all industries will restore prosperity to agriculture and plenty to the peoples of the Empire.

Chemical Engineering Examinations

Papers for Associate-Membership of Institution

As an indication of the scope of the examinations for the Associate-Membership of the Institution of Chemical Engineers, there are reprinted below two of the five papers set at the last examination, held in April, May, and July. As on previous occasions, a viva voce examination was held at the Chemical Industry Club, after the candidates had been entertained to dinner.

HOME PAPER, APRIL AND MAY, 1928.

The candidate may attempt ONE question only under section A and ONE question only under section B.

The answers must be made upon foolscap, squared paper and high-class drawing paper of convenient size, not exceeding 30 by 22 ins.; each sheet or drawing must be signed by the candidate and the declaration enclosed must be filled in and witnessed.

Little credit will be given for correct answers when the method of attack of the problem and the calculations are not given.

Where the slide rule is used, the method should be indicated. Correct graphical solutions will be credited with full marks

SECTION A.

1. Design and prepare scale drawing of the lay-out of a plant to manufacture 1½ tons of anhydrous aluminium chloride per day of 24 hours.

Estimate the cost of the plant and determine if the manufacture of the material on the lines you suggest would be a commercial proposition, assuming office and other charges to amount to 10 per cent. of the selling price.

Pure aluminium turnings, £50 per ton.

Anhydrous aluminium chloride, £150 per ton.

2. Design and prepare scale drawing of lay-out of plant you would suggest in one of the following cases.

Fifty tons of nitric acid of 70 per cent. HNO_3 are required per day. Nitrate of soda (97 per cent. $NaNO_3$) at £9 per ton, and sulphuric acid (80 per cent. H_2SO_4) at £3 5s. per ton are available. Ammoniacal liquor, containing 2 per cent. of NH_3, 0·5 per cent. H_2S and 1·98 per cent. CO_2, is also available at 6d. per ton. Prepare statements showing the relative costs of production, using as raw materials (*a*) nitrate of soda and sulphuric acid, and (*b*) ammoniacal liquor.

Indicate the unit processes involved in the conversion of the ammonia of the ammonical liquor to nitric acid, 70 per cent., and give all the essential data which will enable suitable plant to be designed.

3. It is proposed to erect a plant for the production of 1 ton of ammonia (NH_3) per day (24 hours) by the catalytic combination of nitrogen and hydrogen.

Prepare a detailed report, indicating the principles involved, of the process which you would recommend and give the reasons for your choice.

Draw to scale a diagrammatic plan and elevation of the plant, estimate its cost and the cost of production of the product. It may be assumed that the required nitrogen and hydrogen are available and that the time of contact of the reacting gases with the catalyst is 60 secs.

4. A plant is required for the production of 20 tons per day (24 hours) of lime (CaO) from a limestone, the analysis of which is as follows :—

CaO	53·7 per cent. by weight
MgO	0·6
Fe_2O_3	0·2
Al_2O_3	0·1
CO_2	42·0
SiO_2	3·2
H_2O	0·2

Coal of the following composition is available

Moisture and ash free basis—

C	80·1 per cent. by weight
O_2	13·1
H_2	5·7
N_2	1·1

Moisture content 3·7 per cent.
Ash ,, 5·7 per cent.
Calorific value 14100 B.Th.U. per lb.
(Moisture and ash free basis)

Assuming the coal is to be burnt in a powdered form, design a suitable kiln and estimate the fuel and power requirements for same, the cost of the kiln and the cost of production of the product.

State clearly the principles on which your estimates are made. Draw to scale a plan, sectional elevation and cross section of the kiln and indicate diagrammatically the necessary auxiliary plant for the preparation and conveyance of the fuel to the kiln.

SECTION B.

1. An open cast iron tank having the following internal dimensions, 4 ft. long 3 ft. wide and 1 ft. 1 in. deep, is ¾ in. in thickness. This tank is supported so that 80 per cent. of the area of the base is exposed to the atmosphere and is filled with water at 80° C. to a depth of 1 ft. Calculate how long it will take this tank to cool to 30° C. and what amount of water will be evaporated in that time. Assume that still air conditions exist and the saturation temperature of the air is 10° C.

Take Péclet constant for cast iron as 3·37.

Radiation formula $a(\tau_1^4-\tau_2^4)\times 10^{-8}+b(\tau_1-\tau_2)^{1.23}$ cals. per sq. m. per hr.

Evaporation formula $W=\left(\frac{P_e-P_d}{50}\right)^{1.2}$ kgs. per sq. m. per hr.

where

τ_1 and τ_2 are absolute temperatures in °C.;

a = Péclet constant; b = second constant taken as 2·8; P_e and P_d, vapour pressure at given temperature and dew point respectively.

2. Sketch the design of a cooler for dealing with a solution containing approximately 10 per cent. of free hydrochloric acid. It is required to cool this liquor, specific heat 0·9, to 20° C., from 90° C., at the rate of 1,000 gals. per hour. What materials would you use for the construction of the cooler, and how would your design be affected if low capital cost were of primary importance, assuming cooling water to be available in unlimited quantity ?

3. Design and sketch in plan and elevation a nitrator for the production of 1 ton per charge of Nitrobenzene.

Mixed acid of the following composition is available ;

H_2SO_4	62 per cent. by weight
HNO_3	21
H_2O	17

State any precautions which are necessary and estimate the cost of the apparatus.

4. Design and sketch in plan and elevation a furnace for the production of 3 tons per day (24 hours) of Salt Cake (Na_2SO_4) from Rock Salt, and estimate the fuel requirements.

For calculation purposes :—

The Salt Cake may be assumed to be 100 per cent. Na_2SO_4.

The Rock Salt may be assumed to be 100 per cent. NaCl.

Coke is available of the following composition :—

Moisture free basis.

C	86·3 per cent. by weight
H_2	0·5
O_2	1·5
N_2	0·7
Ash	11·0

Moisture content 3·0 per cent.
Calorific value 14000 B.Th.U. per lb.
(ash free-dry basis).

SECTION C.

Thursday, July 12, 1928.

10 a.m.—1 p.m.

Three hours are allowed for this paper.

The candidate may use the reference books provided.

FOUR questions only may be attempted, TWO to be taken from each part of the paper. Little credit will be given for correct answers when the method of attack of the problem and the calcu-

lations are not supplied. Where the slide rule is used the method should be indicated.

The questions are not intended to test a knowledge of particular formulæ or industrial makes of plant.

Full marks may be obtained by an answer which shows an appreciation of the salient principles involved and an ability to apply these to the purpose in view.

Answers must be written on the paper provided and each sheet must be signed by the candidate.

SECTION C.—PART I.

What type of apparatus would you improvise to measure the quantity of sulphuric acid supplied to an ammonium sulphate "saturator"? Illustrate your answer with sketches and give details of such an apparatus for indicating small variations from a normal flow of 100 lb. of acid per hour, d. 1·74.

2. Discuss the industrial significance of "streamline" and "turbulent" flow of fluids.

3. Describe, stating the principles involved, the method. which are being used for increasing the supply of liquid fuelss

4. Discuss the principles involved in the grading of solid materials by upward current classifiers.

5. State, giving reasons, the influence of

(*a*) high temperature carbonisation of coal,

(*b*) low temperature carbonisation of coal

on the composition, properties and yields of the products.

SECTION C.—PART II.

6. A Pitot tube is inserted at the centre line of a horizontal pipe of 3 in. internal diam., carrying dry air at a static pressure of 2·5 in. of water gauge and temperature 60° F.

A U-tube connected to the impact and static openings of the Pitot tube and inclined at 1 in 10 to the horizontal shows a horizontal deflection of 1 in. of water. The barometer reading is 770 mm. Hg.

Calculate the rate of flow of air in cu. ft. per hour.

The following data may be assumed :

Absolute viscosity of the air under the existing conditions $= 1242 \times 10^{-8} \frac{\text{lb.}}{\text{ft.} \times \text{sec.}}$ units.

Density of the air = 0·081 lb. per cu. ft. at 760 mm. and 0° C.

The relation between (i.) the ratio $\frac{V_{av}}{V_{max}}$ and

$$\text{(ii.)} \quad \log \frac{d\rho V_{max}}{\mu}$$

may be assumed to be

$\frac{V_{av}}{V_{max}}$	0·750	0·775	0·785	0·790	0·800	0·820	0·845
$\frac{\log d\rho V_{max}}{\mu}$	3·740	3·980	4·097	4·197	4·544	4·700	5·000

d being internal diam. of pipe in ft.

V_{av} and V_{max} the average and maximum velocities of the air in ft. per sec.

ρ the density of the air in lbs. per cu. ft.

μ the absolute viscosity of the air in $\frac{\text{lb.}}{\text{ft.} \times \text{sec.}}$ units.

The coefficient of the Pitot tube may be taken as 0·9.

7. The temperature of the contents of a nitrator, with a shell surface of 250 sq. ft., must not rise above 40° C., and the necessary cooling is effected by circulating water in a coil immersed in the contents. The rate of removal of heat is estimated at 200,000 C.H.U. per hour.

Estimate the length of the cooling pipe if

(i.) 1½ in. bore steel pipe

(ii.) 1 in. bore lead pipe

were used for the coil.

The following data may be assumed :

Overall heat transmission coefficient (contents to water) :

for the steel coil—25 C.H.U. per hr. per sq. ft. per ° C.

for the lead coil—32 C.H.U. ,, ,, ,, ,, ,,

The heat loss from the nitrator shell = 140 C.H.U. per hour per sq. ft.

Water is available at 10° C.

Assume a convenient outlet temperature for the water.

8. 4,000 gals. of an oil at a temperature of 20° C. have to be heated to 90° C. per hour. It is proposed to use a double pipe heat interchanger and to circulate through the inner pipe an oil which is available at 120° C. The oil to be heated is circulated through the annular space between the concentric pipes of the heat interchanger.

Assuming counter-current flow, estimate the length of pipe theoretically needed. Radiation and convection loss from the outside of the interchange may be neglected.

The following data may be assumed :

The inner pipe is of bore 1 in. and of thickness 0·125 in.
The outer ,, ,, 2 in. ,, ,, ,, 0·125 in.
Film conductance for the outer oil film
= 120 C.H.U. per hour per sq. ft. per ° C.
and for the inner oil film
= 56 C.H.U. per hour per sq. ft. per ° C.
Thermal conductivity of the pipe
= 25 C.H.U. per hour per sq. ft. per ° C. per ft. thick.
The specific heats of both oils may be taken as 0·5.
,, gravities ,, ,, ,, ,, ,, 0·8.

Assume a convenient outlet temperature for the heating oil.

9. The gases leaving a sulphur burner, at a temperature of 600° C., consist of :

SO_2	800 lb. per hour.
SO_3	20 ,,
Air (O_2 and N_2)	3,900 ,,
H_2O	20 ,,

and are to be cooled to 340° C. by being blown outside, and perpendicular to, vertical cast iron pipes—5 in. bore and ⅜ in. thick—through which is circulated a gas mixture of the following composition :

SO_2	10·4 per cent. by weight.
Air (O_2 and N_2)	89·6 ,,

The gases enter the heat interchanger at 190° C. and leave at 330° C.

Neglecting radiation and convection losses from the interchanger to the air, estimate the length of pipe required.

The mean specific heats for the gases for all the temperatures involved may be taken as :

SO_2	0·154
SO_3	0·138
O_2	0·216
N_2	0·246

Overall heat transmission coefficient = 3·2 C.H.U. per hour per sq. ft. per ° C.

10. The following data were obtained during a test on a gas fired boiler :

Analysis of Original Fuel Gas.

CO_2	2·1 per cent. by volume.
O_2	0·8 ,, ,,
CO	13·8 ,, ,,
H_2	41·3 ,, ,,
CH_4	22·9 ,, ,,
N_2	15·0 ,, ,,
Illuminants	4·1 ,, ,,

Analysis of Flue Gas.

CO_2	5·9 per cent. by volume.
O_2	8·0 ,, ,,
CO	1·9 ,, ,,
N_2	84·2 ,, ,,

Average steam pressure in boiler .... = 100 lb. per sq. in. gauge
Feed water temperature ..... = 17·4° C.
Gas passed at meter ..... = 10,550 cu. ft.
Pressure of gas at meter ..... = 4 in. water gauge.
Temperature of gas at meter ..... = 14·6° C.
Reading of barometer ..... = 765 mm. Hg.
Vapour pressure of water at 14·6° C. = 12·35 mm. Hg.
Water evaporated ..... = 2,300 lb.
Lower (net) calorific value of gas .. = 420 B.T.U. per cu. ft., measured at 760 mm. and 14·6° C.

Estimate (i.) percentage excess air.

(ii.) net thermal efficiency of the boiler.

Research on Empire Products

Growing Activity of the Empire Marketing Board

THE Empire Marketing Board has just issued its second report, covering the period May, 1927, to May, 1928 (H.M. Stationery Office, pp. 64, 1s.). The section of the report dealing with research deserves note.

It is pointed out that the Board in its first report emphasised the fact that it undertook no scientific research work itself, and that, in recommending grants, it was consistently guided by the different Government organisations, whether at home or overseas, that were best qualified to advise it.

Wide Scope of Work

The Board has continued to regard its prime function as the furtherance of basic research work, applicable sometimes to the whole of the Empire, but always to more than one of its countries. It has deliberately chosen the part of sustaining scientific enterprises whose wide bearing or distant range removed them from the scope of any single Empire Government. A year ago it was explained that certain fields of scientific research alone had as yet come under the Board's review, and that the short time during which the Board had been at work, as well as the relatively advanced stage reached in the staffing and equipment of the United Kingdom institutions, had led to a predominance of grants being made to home organisations. These considerations still apply. But it is hoped that it will prove possible in the future to strike a just balance, not merely between the various branches of agricultural research, but between their developments in the different Empire countries.

Fisheries Research

The Imperial Economic Committee issued a report on Fish in August, 1927. Its chief recommendation was that a research station should be erected for the study of the problems of the preservation of fish and the production and utilisation of fish by-products.

The Imperial Economic Committee also recommended that further research work should be undertaken into the qualities of cod liver oil and the possibility of improving yet further the market qualities of the oils produced at home and in Newfoundland which have already been proved to be of exceptionally high vitamin content. A grant has accordingly been made for the carrying out of work upon these problems.

Chemistry at the British Association

Programme of the Edinburgh Meeting

THE chemistry section of the British Association, at the Edinburgh meeting, will begin its activities on Thursday, September 6, when the presidential address will be delivered by Professor E. C. C. Baly, F.R.S., who will deal with Fluorescence, Phosphorescence, and Chemical Reaction. On Friday, September 7, there will be a discussion on Fermentation. The discussion will be devoted chiefly to the chemical and physico-chemical aspects of fermentative processes, and among those participating are Dr. J. Vargas Eyre, Dr. A. C. Thaysen, Mr. Julian L. Baker, Mr. H. F. E. Hulton and Mr. W. Rintoul. On the same day (and on subsequent days) films lent by I.C.I., Kodaks, and Sir James Irvine, F.R.S., will be shown. In the afternoon visits to the works of (*a*) Messrs. R. and W. Watson, Ltd., papermakers; and (*b*) Messrs. J. and R. Tennent, Ltd., Wellpark Brewery, will be made, as well as to the Royal Technical College. On Saturday, September 8, there will be a visit to the Ardeer Factory of Nobel's Explosives Co., at the invitation of Imperial Chemical Industries.

On Monday, September 10, Dr. E. K. Rideal, assisted by Mr. G. Smith, will give demonstrations of light reactions (physical, gaseous, and in solution), and these will be followed by a discussion. In the afternoon there will be a visit to the Corporation Gas Works, Maclaurin Plant, Dalmarnock, the Provan Gas Works, and the Provan Chemical Works. On Tuesday, September 11, Sir William Pope, F.R.S., will open a discussion on "Recent Advances in Stereo-chemistry." In the afternoon, there will be a visit to the works of Shanks and Co., Ltd.

Artificial Silk Factory Fumes

£5,000 Plant Installed for Prevention

IN THE CHANCERY DIVISION, before Mr. Justice Astbury, on Thursday, July 19, the Rayon Manufacturing Co. (1927), Ltd., were sued by the Attorney-General, at the instance of the Epsom Rural District Council, who asked for an injunction to restrain the company from creating a public nuisance by discharging obnoxious fumes from their artificial silk factory at Ermyn Way, Ashtead, in the Epsom Council's area. Mr. Spens, K.C., for the council, said it was a case in which fifty witnesses were to have been called. The company had now taken a course which would shorten the action, as they had agreed to submit to an injunction and to pay costs, but they wanted the injunction to be suspended for a long period, and this period was in dispute.

Mr. Grant, K.C., for the company, said a new machine for dealing with the fumes had just been installed at a cost of £5,000, and they asked for the injunction to be suspended for three months while the machine was being put into perfect working order.

Objecting to the suspension, Mr. Spens said the fumes were most obnoxious. The health of a number of people in the district had been affected. People found it impossible to remain in their houses.

Mr. Grant said the machine would eliminate the fumes when it was properly tuned up.

Expert Evidence

Dr. J. S. Owens, Superintendent of Observations of Atmospherical Pollution of the Department of Industrial and Scientific Research, said he inspected the new machine for cleaning the fumes, the first of its kind to be erected outside Germany.

Mr. Grant: All makers of artificial silk are under this disability of producing fumes?—A good many.

This is the first attempt to deal with it in England?—I believe so.

Mr. John William Hinchley, Professor of Chemical Engineering at the Imperial College of Science and Technology, said he had visited the factory.

Mr. Spens: I have got evidence of the smell being found a mile away.

Professor Hinchley: It is quite possible.

Mr. Grant: But you don't believe that people a mile away are being seriously inconvenienced?—No.

Mr. Justice Astbury: I cannot understand why these people went to Epsom with their factory.

Mr. Grant: They have spent half a million on getting into working order there and they must go on now.

Mr. Justice Astbury: It was a foolish site to choose for these works originally.

When the discussion of smells was renewed, Mr. Justice Astbury said: "You may be smelling the ozone. Ozone is supposed to be the most harmless gas in the world, yet it has a perfectly abominable smell."

His lordship granted a suspension of the injunction for three months on condition that the company undertook to try to keep the plant running, and to use every endeavour not to cause a nuisance should the new cleaning machinery break down.

Whale Guano in South Africa

Two firms in Cape Town are engaged in the production of whale guano. The official South African statistics for the year 1926 report exports of 2,483 tons described as "guano" and 2,061 tons of "other whale manure." During that year the United States was the most important outlet, with Ceylon and the United Kingdom registered as the destinations for the bulk of the remainder. The whaling season commences about May 1, and shipments of guano as a rule start in June and July. The disposal of the supplies has not, in the past, followed any fixed channel. Prices vary from year to year, and the guano is sold only after a canvass has been made of the principal markets. In the majority of instances it has been sold through London brokers.

Indian Chemical Notes

[From Our Indian Correspondent.]

The total imports of chemicals and chemical preparations, excluding chemical manures and medicines, during the year 1927 were valued at Rs.266 lakhs, as against Rs.232 lakhs in the previous year. There is a steadily growing demand for chemicals in India. The soda compounds alone were worth Rs.110 lakhs, and potassium compounds 10 lakhs. The imports of sulphur were valued at 20 lakhs. About 9 lakhs worth of disinfectants, another 9 lakhs worth of bleaching powder, 6 lakhs worth of acid, and about 10 lakhs worth of ammonia and salts were also imported. The value of China Clay imported was Rs.23 lakhs, as against 17 lakhs in the previous year.

Foreign v. Indian Salt

The question as to whether any protective duties should be imposed on imports of foreign salt into India has finally been disposed of by the Government of India, who have come to the conclusion that there is no need to refer the matter to the Tariff Board for enquiry as suggested by the Taxation Enquiry Committee some time ago with a view to making India self-supporting in the matter of salt supply.

The reasons for this decision are lucidly set forth by the Central Board of Revenue. The principal markets for foreign salt in India are Bengal and Orissa, and about 90 per cent. of the salt imported at Calcutta and Chittagong is fine, white, crushed salt from Liverpool, Aden, Port Said, and only 10 per cent. is white uncrushed salt from Aden, Egypt, or Spain. There is reason to believe that at least a considerable majority of those who consume imported salt have a definite preference for crushed salt, and normally uncrushed salt is used for cattle. It seems certain, therefore, that so long as the people of Bengal can afford to buy foreign salt, those who now use is will never transfer their custom on any large scale to Madras or Bombay salt, however cheap it may be.

Difficulties of Manufacture

If the Calcutta market for white crushed salt is to be captured for Indian salt, that cannot be achieved by reducing the price of inferior Indian salt or by raising a tariff of any reasonable dimensions against foreign salt. The possibility of manufacturing salt on a commercial scale in Bengal or Orissa has been examined by the Government on many occasions, only to be rejected. It is rendered impracticable by low density of sea brine due to the enormous discharge of fresh water from great rivers, the prevalence of damp, cloudy weather, the scarcity of fuel, and the occurrence of storms at the critical season. In Bombay, salt factories have a short season and high manufacturing costs, and for generations they have concentrated on the production of a quality not suited to the Calcutta market.

Tuticorin, in the Madras Presidency, no doubt possesses considerable natural advantages, but crushed salt fit to compete with imported crushed salt could not be made there owing to the presence of magnesium chloride and other impurities. Only uncrushed salt could be produced in Tuticorin, and placed in the Calcutta market at 11 annas per maund, but imported uncrushed salt would be cheaper, and no less than 4½ annas per maund bounty is required to enable Tuticorin salt to sell in Calcutta at a reasonable profit. As regards Karachi salt, this could be brought to Calcutta at a price almost equal to foreign salt, but this is on the assumption that foreign manufacturers could not afford to cut their prices. For all these reasons, it is considered impossible in the near future to expand the output so as to render the country self-supporting.

The Case of Burma

So far, however, as Burma is concerned, there exists there an annual market of 16 lakhs of maunds that could probably be captured and retained permanently for the local industry by a moderate degree of assistance for a sufficient length of time to enable the output to be increased and the price reduced. At the same time, every effort should be made to develop transport facilities, to cheapen fuel supply, and to improve methods of manufacture. For this purpose, a separate Salt Department will be organised for Burma under the control of the Central Board of Revenue. Of course, the imposition of any differential duty is out of the question as it is against policy, but other measures of assistance would be adopted to make Burma self-supporting in the matter of salt supply. S. G. W.

Canadian Chemical Production

A Record Figure Last Year

During 1927 Canada's output of chemicals and allied products had a production value of $126,668,773, thus exceeding the record figure attained of $122,589,526 attained in 1926, and those of all previous years since the close of the war. The progress in this branch of manufacturing in the Dominion has been exceedingly encouraging in that with one slight exception increases have been registered from year to year since the depth of the depression following the war. Canada's chemical and allied products industry now numbers 560 establishments in which the invested capital exceeds $134,000,000. These plants gave employment to 14,400 employees to whom over $18,500,000 was paid in salaries and wages. Through manufacturing Canadian workmen added over $63,000,000 to raw materials which cost $63,500,000.

Increase in Production

With only one exception, the industries in the chemical and allied products group reported higher total output values in 1927 than in 1926. Production from the acids, alkalies, salts and compressed gases industry, which is the most important, amounted to $30,679,260, an increase of $446,938 over 1926; paints, pigments and varnishes gained $557,450 to $25,360,687; soaps, washing compounds and toilet preparations advanced $538,649 to $19,611,177; medicinal and pharmaceutical preparations rose $677,150 to $16,059,625; the miscellaneous chemical industry increased slightly to a total of $311,851,164; coal tar and its products advanced $666,182 to $3,754,325; inks, dyes and colours, $324,330 to $3,144,275; fertilisers, $179,600 to $1,629,189; and explosives, ammunition, fireworks and matches, $765,859 to $12,921,079. The one exception to the list of advances was the decline in the value of production of wood distillates and extracts from $1,734,993 in 1926 to $1,587,704 in 1927.

With regard to imports, in 1927 Canada imported chemicals and allied products to the value of $33,313,500, an increase of $2,000,000. Purchases from the United States amounted to $22,022,946, from the United Kingdom $4,347,931, and from other countries $6,942,623. Exports from Canada had a value of $17,854,915, comprising exports to the United States valued at $8,834,844, to the United Kingdom $3,926,063, and to Mexico $1,676,417. Other countries to which Canada exported chemical products in quantity were: Japan, $595,500; Portuguese Africa, $481,012; Newfoundland, $477,750; Cuba, $260,774; Australia, $195,868; Belgium, £135,442; and New Zealand, $121,400. A score of other countries also took Canadian chemical products.

Below is given a tabulated account of the chemicals produced in Canada in 1926 and 1927.

Chemicals and Allied Products in Canada, 1926-1927

Year.	No. of Plants.	Capital Employed. $	No. of Employees.	Salaries and Wages. $	Cost of Materials. $	Selling Value of Products. $	Value added by Manufacturing. $
Coal Tar and Its Products.							
1926	15	4,147,163	183	257,305	1,859,879	3,088,053	1,228,174
1927	16	4,251,271	213	301,789	2,346,961	3,754,235	1,407,274
Acids, Alkalies, Salts and Compressed Gases.							
1926	43	38,389,663	2,400	3,597,473	13,360,268	30,232,322	16,872,054
1927	41	35,312,251	2,185	3,463,061	15,655,643	30,679,260	15,023,617
Explosives, Ammunition, Fireworks and Matches.							
1926	14	16,857,120	2,109	2,243,455	6,827,317	12,155,220	5,327,903
1927	16	18,328,869	1,946	1,926,852	6,871,855	12,921,079	6,049,224
Fertilisers.							
1926	12	1,891,054	221	210,427	1,047,641	1,449,589	401,948
1927	12	1,930,292	226	212,060	1,131,756	1,629,189	497,433
Medicinal and Pharmaceutical Preparations.							
1926	130	17,194,519	2,365	2,875,677	5,552,699	15,382,475	9,829,776
1927	135	17,456,923	2,531	3,125,831	5,752,837	16,059,625	10,306,788
Paints, Pigments and Varnishes.							
1926	64	22,890,807	2,484	3,375,061	13,105,367	24,803,237	11,697,870
1927	62	23,168,070	2,574	3,568,069	13,048,952	25,360,687	12,311,735
Soaps, Washing Compounds and Toilet Preparations.							
1926	108	17,351,378	2,068	2,589,460	10,959,995	19,072,528	8,112,533
1927	111	19,375,731	2,122	2,680,315	11,272,670	19,611,177	8,338,507
Inks, Dyes and Colours.							
1926	27	2,729,166	441	728,273	1,069,957	2,819,945	1,749,988
1927	28	2,857,823	439	724,214	1,163,639	3,144,275	1,980,636
Wood Distillates and Extracts.							
1926	9	2,217,049	255	214,694	827,575	1,734,993	907,413
1927	11	1,907,514	291	254,766	865,081	1,587,704	722,623
Miscellaneous Chemical Industries.							
1926	134	9,739,972	1,819	2,216,652	5,513,884	11,851,164	6,337,280
1927	128	9,961,729	1,878	2,328,940	5,403,093	11,921,542	6,518,449
Total Chemicals and Allied Products.							
1926	556	133,407,891	14,345	18,309,377	60,124,582	122,589,526	62,464,944
1927	560	134,550,473	14,405	18,585,897	63,512,487	126,668,773	63,156,286

Chemical Matters in Parliament

Ice Cream

LIEUT.-COLONEL ACLAND-TROYTE (House of Commons, July 15) asked the Minister of Health whether he had any evidence indicating that ice cream sold to the public was made of synthetic cream; and whether any steps were taken to prevent this practice. The Parliamentary Secretary to the Ministry of Health (Sir Kingsley Wood), stated that substances sold as ice cream did sometimes contain the ingredients of which synthetic cream was composed. Local authorities generally had considered that they could not with advantage take any steps to prevent this practice since there was at present no statutory definition of ice cream.

Mr. Montague asked whether the parliamentary secretary was aware that the basis of a great deal of the ice cream which was sold to the public in this country was lard.

Poison Gas

Lieut.-Colonel Sir Frederick Hall (House of Commons, July 18) asked whether, seeing that under the Treaty of Versailles the Allies were empowered to take such steps as might be necessary from time to time to ensure that no posion gas was being manufactured or stored nor any plants being maintained which could be utilised for that purpose, the League of Nations were taking any action entirely to prevent the use of such gases in future warfare? Sir A. Chamberlain replied that under the auspices of the League a Protocol was signed at Geneva in 1925 prohibiting the use of gas in warfare. This Protocol had so far only been ratified by six States, not including this country. His Majesty's Government were not prepared to ratify the Protocol unless all the other signatories were ready to do the same.

Pacific Phosphates Co.

Mr. Hardie (House of Commons, July 18) asked the Prime Minister whether he would set up an inquiry under the Tribunals of Inquiry (Evidence) Act, 1923, to inquire into the circumstances whereby £3,500,000 of public money was paid in compensation in 1922 to the Pacific Phosphates Company; and who advised such payment? The Prime Minister replied that the former interests of the Pacific Phosphate Co. in the phosphate deposits in Nauru and Ocean Islands were acquired by the United Kingdom, Commonwealth of Australia and New Zealand Governments on the terms explained to Parliament in Cmd. 749 of 1920. The arrangement was confirmed by the Nauru Island Agreement Act, 1920, and he found no occasion for inquiry into the matter.

Coal Carbonisation.

Mr. Johnston (House of Commons, July 19) asked the Prime Minister whether he was aware that foreign coal interests were negotiating for the exclusive rights of a carbonisation process for the extraction of oil from coal and the manufacture of smokeless fuel, invented by Mr. Charles Turner and now in experimental operation at Coalburn, Lanarkshire; and whether, in the national interest, he would have immediate inquiries made with a view to the retention of this process in British hands? The Secretary for Mines (Commodore Douglas King) said that His Majesty's Government had no knowledge of the negotiations, but the Fuel Research Board were aware of the nature of the process, and there appeared to be no reason in the national interest to interfere with the owner's freedom to dispose of his rights in it as he thought fit.

River Pollution

Sir Arthur Churchman (House of Commons, July 23) asked the Minister of Agriculture whether, in view of the fact that pollution of the River Gipping through the effluent from the artificial silk works at Stowmarket was causing serious damage to riparian cultivators by infecting the water and thereby poisoning stock, he would without delay cause an investigation to be made into the circumstances? Mr. Guinness replied that he had received from time to time complaints of pollution in that river, but investigations carried out last year indicated that illness among pigs was due to swine fever, and that there was no evidence of poisoning of live stock due to pollution.

In reply to further questions about the pollution of the River Gipping, Sir K. Wood (House of Commons, July 24) stated that the Minister of Health had received from the rural district council an application for consent to take proceedings against the company concerned, and had directed a public inquiry to be held at the earliest practicable date into the application.

Foods and Drugs (Adulteration) Bill

On July 23 the House of Lords passed the Bill intituled "An Act to consolidate the Sale of Food and Drugs Acts [Foods and Drugs (Adulteration) Bill]."

"L. & N." Plant in Leicestershire

THE extraction of oil and other products from coal has now commenced on a large scale in Leicestershire, where the "L. and N." Coal Distillation Co., Ltd., operating in conjunction with the Leicestershire Colliery and Pipe Co., Ltd., at New Mount Collieries, Ashby-de-la-Zouch, have erected a large plant. This is attracting much interest in the commercial world, and the new plant and collieries were visited on Wednesday, July 11, by the president of the London, Midland and Scottish Railway Co. (Sir Josiah Stamp), together with the vice-presidents and superintendents of all the technical and administrative departments, in order that all concerned might familiarise themselves with this new process. The plant at Ashby is claimed to be larger than any existing single low-temperature coal distillation unit suitable for the treatment of Midland coals, which are non-coking. Every ton of coal passed through the plant produces about 22 gallons of oil and 13 cwt. of smokeless fuel. The visitors included, in addition to Sir Josiah Stamp, Messrs. S. H. Hunt, J. H. Fellows, R. D. Reid, Sir Henry Fowler, Messrs. C. R. Byrom, E. J. H. Lemon, E. Wharton, J. Murray, Lieut.-Col J. T. C. Moore-Brabazon, M.P., Messrs. Bryan Laing, Frank Hodges, Phillip Tennant F. Middleton, R. D. Hardy, Ronald Johnstone, and E. D. P. Hardy.

Antimony from Enamel Causes Poisoning

THE Newcastle City Analyst reports that the cause of the temporary illness among the staff of a local firm recently was antimony compounds contained in the lemonade which the staff drank, and the source was enamel on the buckets, which contained the made-up lemonade. The samples which were analysed, some taken from single buckets, and one from a mixture of a number of buckets, all contained considerable amounts of antimony compounds, and it was established that the enamel of the buckets contained antimony which was easily extracted from it by acid. The lemonade crystals were perfectly free from antimony or any other harmful substance, and were quite harmless in themselves. The acid liquid made from the crystals had dissolved antimony from the enamel while standing in the buckets. Antimony oxide is a very usual constituent of these enamels, and not all of them would be acted on so readily as this one, adds the analyst. But it was well that the public should know that there would always be a tendency for this to happen, and that it was highly inadvisable to keep acid liquids in such vessels. Glass, porcelain, or other ware, or wooden vessels, should be used.

Sir Ernest Benn's Dinner to Colonel House

THE Prince of Wales honoured Sir Ernest Benn with his presence on Tuesday night at a private dinner to Colonel House at Whitehall Court. The other guests present were: The Lord Chief Justice, the Dean of St. Paul's, Major the Hon. J. J. Astor, Sir William Berry, Sir Herbert Samuel, Sir Godfrey Thomas, Sir Robert Donald, Mr. R. D. Blumenfeld, Mr. Gordon Robbins, Sir John Reith, Mr. John Benn, Mr. Glanvill Benn, and Mr. Keon Hughes.

Appointments Vacant

TEMPORARY ASSISTANT CHEMISTS in the Government Laboratory.—The Government Chemist, Clement's Inn Passage, Strand, London, W.C.2. August 4.

ASSISTANT ANALYST in the Government Analyst's Department, Trinidad.—The Private Secretary (Appointments), Colonial Office, 2, Richmond Terrace, Whitehall, London, S.W.1. August 20.

CHEMIST for Wood Extract Factory in India.—Dr. M. Nierenstein, The University, Bristol. Further details are given in our advertisement columns, p. xlii.

From Week to Week

LORD AND LADY MELCHETT have left London for the Continent.

COLONEL J. G. BROCKBANK has been elected to a seat on the board of Continuous Coal Carbonization.

A CALENDAR for the second half of this year has been received from Cochran and Co., Annan, Ltd.

THE FUSION of the German firms of J. D. Riedel and de Haen was approved at a general meeting held recently.

MR. G. BUCHANAN and Mr. V. Echeverria have joined the board of the New Tamarugal Nitrate Co., in London.

PROFESSOR BIJLMANN has been elected president of the International Union of Pure and Applied Chemistry.

THE HUDDERSFIELD TECHNICAL COLLEGE is offering three scholarships for research on dyeing and colour chemistry. Further details may be found in our advertisement columns, p. xli.

THOMAS W. WARD, LTD., in addition to the acquisition of a controlling interest in Ketton Portland Cement, have now purchased the share capital of the North Lonsdale Tarmacadam of Ulverston.

THE "L. AND N." coal distillation plant, it is stated, is working mechanically successfully, and shows promise of possessing a throughput very considerably above that which was originally guaranteed.

THE LIBRARY of the Chemical Society of London will be closed for stocktaking from Monday, August 6, until Saturday, August 18 inclusive, and will close each evening at 5 o'clock from August 20 to September 15.

MR. HAROLD TALBOT, Chairman of the Chemical Engineering Group, will be unable, as he had intended, to accompany the chemical engineering party who leave for Canada on August 11, in consequence of important business that will detain him in London.

AN ARRANGEMENT has been entered into between Vickers-Armstrongs, Ltd., Broadway House, Westminster, S.W.1, and Automatic and Electrical Furnaces, Ltd., Elecfurn Works, North Road, Holloway, London, N.7, whereby the latter company will demonstrate and sell the Vickers-Armstrongs hardness testing machine.

MR. DONALD J. LEITCH, managing director of J. W. Leitch and Co., Ltd., Milnsbridge Chemical Works, near Huddersfield, has been presented with a solid silver waiter, suitably inscribed, from the staff and workpeople of the firm, to mark the occasion of his wedding. The workpeople were given a day's holiday, with full pay, to celebrate the occasion.

UNIVERSITY NEWS.—*Leeds:* Dr. C. E. Marshall has been appointed assistant lecturer in agricultural chemistry.—*London:* DR. F. A. Freeth, F.R.S., of Imperial Chemical Industries, has been appointed Honorary Lecturer in the Theory and Practice of Heterogeneous Equilibria at University College; and Mr. O. J. Walker has been appointed lecturer in the department of chemistry.

THE ANNUAL CONVENTION of Canadian Chemists, held in London, Ontario, June 6, 7 and 8, 1928, marked new progress in the field of chemical activities in the Dominion. A new organisation, the Canadian Chemical Association, was formed to federate the existing chemical organisations in Canada for the promotion of common aims. Professor G. S. Whitby, of McGill University, is the first president.

DR. HAMILTON BRADSHAW, chemical director of E.I. Du Pont de Nemours and Co., has arrived for an extended tour in this country and on the Continent. Dr. Bradshaw attended the International Cancer Conference, being interested in the chemical aspect of the subject, and intends also to investigate the newer developments in cellulose research. His address while in this country is the Du Pont Co., 54, New Broad Street, London, E.C.2.

A MINISTRY OF HEALTH INQUIRY was begun by Mr. F. O. Stanford on Tuesday, in Bradford, into an application by various West Riding local authorities for the confirmation of by-laws, under the Public Health (Smoke Abatement) Act, 1926. When a by-law was first advertised providing that the emission of black smoke for an aggregate of two minutes in any period of 30 minutes should constitute a nuisance, Bradford Chamber of Commerce protested, and the inquiry was the sequel.

INDEX FIGURES comparing the value of imports and exports for the first six months of 1924 with those of succeeding years are given in the *Board of Trade Journal* for July 26. Taking the index number for 1924 as 100, the index numbers of the imports of chemicals, drugs, dyes and colours for 1928 were: Average values, 94·8, quantities, 116·1; for exports of imported produce, average values 78·9, quantities 96·5; imports retained, average values 96·1, quantities 118·0; exports of United Kingdom produce, average values 86·5, quantities 114·2. The values in 1928 estimated at average values in 1924 were: Total imports, £8,295,000 (1924, £7,146,000); exports of imported produce, £1,129,000 (1924, £1,705,000); imports retained, £7,680,000 (£6,509,000); exports of U.K. produce, £14,836,000 (1924, £12,989,000). As regards the chemical and allied trades, the index number of production (1924 = 100) for the year 1927 was 110·2, and for the first quarter of 1928, 117·4.

DR. L. M. HIRCHBERG has been appointed adviser to the British Export and Investment Co., Ltd., of 57, Bishopsgate, London.

THE MONTECATINI COMPANY'S nitrocellulose lacquer works, in the neighbourhood of Turin, will shortly come into operation.

THE SEVENTH COLLOID SYMPOSIUM will meet at the Johns Hopkins University, Baltimore, Maryland, U.S.A., from June 21 to 23, 1929. The sixth symposium was held in Toronto in June.

ROCKEFELLER FOUNDATION SCHOLARSHIPS have been awarded to Dr. F. J. W. Roughton, of the University of Cambridge, and Mr. A. Wormall, M.Sc., lecturer in biochemistry in the University of Leeds, among others.

IMPORTED GLUE AND GELATINE, as from October 13, will be required to bear an indication of origin. This arises from Merchandise Marks (Imported Goods) No. 2 Order, 1928, which comes into force on the date mentioned.

THE INDIAN TARIFF BOARD is to investigate the question of protection for sulphuric, hydrochloric, and nitric acids, and other substances manufactured in India. The question of the removal of tariffs from chemicals used in Indian industries will also be considered.

WASTE FOOD PRODUCTS, LTD., have acquired an established business connected with purchase of offal, etc. Matusa Works, at Beckton Road, London, E., have now been equipped and have started working. The directors report that they are well ahead of original working programme.

CINEMATOGRAPH FILMS for the purpose of illustrating scientific investigation, for exhibition before a recognised scientific body, will, according to a clause of the Finance Bill agreed to in the House of Commons on Tuesday, be non-liable for Customs duty. The Royal Society is to be the body which will certify the films as fulfilling the conditions named.

A COMMITTEE has been appointed by the Institution of Gas Engineers to consider the question of the production and disposal of ammonia in the gas industry. The chairman is Mr. C. F. Botley, and the members include Professor J. W. Cobb (who is the secretary), Mr. H. E. Bloor, Mr. E. V. Evans, Mr. H. Hollings, Mr. P. G. G. Moon, Dr. A. Parker, Mr. T. F. E. Rhead, Dr. E. W. Smith, Mr. W.W. Townsend, and Mr. J. Wilkinson.

THE JOINT RESEARCH COMMITTEE of the Institution of Gas Engineers and the University of Leeds has issued its seventeenth report, which records further study of the products of combustion of typical gas appliances, and in particular the evolution of carbon monoxide in the flue gases from gas fires. This reached 30 parts per 10,000 of gas burned in such a fire when properly regulated. The actual concentration in the flue gases is, however, much less—it may be as little as one two hundred and fiftieth of this owing to the dilution of the flue gases, which varies from case to case.

THE INTERNATIONAL CHAMBER OF COMMERCE has just issued the summer number of its "List of Fairs and Exhibitions," containing full information concerning all fairs and exhibitions to be held in 51 countries from the present to May 31, 1929. This publication is of great value to manufacturers and merchants, as it contains a detailed index and full information as to the prices of stands, transport, and other facilities granted to exhibits, the number of exhibitors, visitors, buyers, etc. Further information may be obtained from the Secretariat General of the International Chamber of Commerce, 38, Cours Albert 1er, Paris, VIIIe.

THE NEDERLANDSCHE CHEMISCHE VEREENIGING celebrated the twenty-fifth anniversary of its foundation on July 15–17. The festivities took place at The Hague immediately before the meeting of the International Union of Pure and Applied Chemistry. The president of the Nederlandsche Chemische Vereeniging is Professor S. C. J. Olivier. Honorary membership was conferred on several foreign chemists, including Professor F. G. Donnan, professor of general chemistry in the University of London, at the anniversary meeting. The society publishes the *Chemische Weekblad* and the *Recueil des Travaux Chimiques des Pays-Bas*.

ARTIFICIAL SILK NEWS.—On Tuesday, Alliance Artificial Silk, Ltd., invited subscriptions for an issue of 4,680,000 shares of 5s. each. Details were given in these columns last week. The technical consultants to the company are Dr. S. Wild, of Basle; Sindall and Bacon, and Sir Hugh Keeling. The issue was over-subscribed.—A company known as the First Rumanian Artificial Silk Factory has been founded in Rumania by the Vereinigte Glanzstoff Fabriken and the Banca Romaneasca, for the production of artificial silk by the Elberfeld process.—Of the four artificial silk factories in Spain, three are producing (viscose only).—Courtauld's are said to be considering the erection of an artificial silk yarn factory at Bamber Bridge, near Preston.

Obituary

MR. CHARLES E. BOND, a director of Leonard Hill, Ltd. For many years he was associated with Benn Bros., Ltd., for some time as advertisement manager of THE CHEMICAL AGE.

MAXIMILIAN RIPPER, in Austria, on June 9, aged 64. He was formerly head of the agricultural chemical experimental station at Görz.

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GENERAL.—The neutralisation of milk and its detection. R. Strohecker. *Zeitschrift analytische Chem.*, Vol. 74, Parts 1–2, pp. 1–28.

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The mechanism of oxidaton processes. Part XIV. The activation of oxygen by means of iron. H. Wieland and W. Franke. *Annalen*, Vol. 464, Part 2, pp. 101–226.

INORGANIC.—Progress in the chemistry of fluorine. O. Ruff. *Zeitschrift angewandte Chem.*, July 7, pp. 737–740.

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ORGANIC.—The electrolytic reduction of dithio-diglycollic acid. E. Larsson. *Berichte*, July 11, pp. 1439–1443.

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Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

292,342. Hydrogen-Nitrogen Mixtures, Process for the Production of. M. Casale-Sacchi, Villa Porticciuolo, Rapallo, Italy. Application date, June 7, 1927.

Mixtures of hydrogen and nitrogen suitable for the synthesis of ammonia are obtained from hydrocarbons and liquid air. Oxygen obtained from liquid air by distillation and containing 2 to 3 per cent. of nitrogen is employed in the incomplete combustion of hydrocarbons in the presence of steam. The carbon monoxide in the product is catalytically converted into carbon dioxide by further addition of steam, and water is separated by cooling. The carbon dioxide is separated from the gas, and the remaining hydrogen is mixed with nitrogen obtained by fractionation of the liquid air. The oxygen employed may have a higher proportion of nitrogen, in which case a smaller addition of nitrogen is necessary to obtain the correct proportion of the nitrogen-hydrogen mixture.

292,344. Dyestuffs containing Chromium, Manufacture of. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, June 9, 1927.

The *o*-hydroxy-azo dyestuffs obtained from diazotised 4-chlor-2-amino-phenol and naphthol-monosulphonic acids are heated under a reflux condenser or in an autoclave under pressure with compounds of trivalent chromium. The resulting dyefituffs give reddish to bluish-violet shades on wool, fast to washing and light. Examples are given of the treatment of the azo dyestuff obtained from diazotised 4-chlor-2-aminophenol and 2 : 6- or 1 : 5-naphthol-sulphonic acid with a chromium oxide paste containing formic acid. Reference is directed in pursuance of Section 7, Subsection 4, of the Patents and Designs Acts of 1907–1928, to Specification No. 26,460/1912.

292,404. Heat Exchangers for Use in Catalytic Apparatus. Synthetic Ammonia and Nitrates, Ltd., and F. H. Bramwell, Billingham, Stockton-on-Tees, Durham. Application date, October 27, 1927. Addition to 241,817.

Specification No. 241,817 (See The Chemical Age, Vol. XIII, p. 558) describes a heat exchanger consisting of one or more spirals of a pair of co-axial tubes surrounding the catalyst chamber, the outflowing gases passing through the inner tube and the inflowing gases passing through the outer tube. This apparatus involved a difficulty in arranging the inner tube centrally within the outer tube to obtain a uniform annulus. It is now found that this difficulty can be avoided by employing a number of inner tubes within the outer tube (preferably 3 or 7 for reasons of symmetry). These tubes automatically divide the available space into channels of equal size so that the inflowing gases which flow through the spaces are evenly subdivided and the most efficient heat exchange is obtained.

292,433. Clarification of Benzine, Process for. J. J. Wack, 10, Rue Oberlin, Colmar, Haut-Rhin, France. Application date, January 13, 1928.

Benzine containing oils and fats is purified by injecting it in a finely atomised condition into an alkaline solution which saponifies the oils and fats, and the benzine separates out by difference of density. The alkaline solution may be sodium carbonate mixed with sodium chloride or with an alkaline bleaching agent such as a mixture of calcium hypochlorite and potassium carbonate.

292,629. Phenol-Formaldehyde Condensation Products, Manufacture of. G. Bia, 499, Avenue Louise, Bruxelles, Belgium, and J. E. Douzal de Granville de Bielize, 5, Rue Dumont d'Urville, Paris. Application date, January 17, 1927.

Phenol or meta-paracresol is mixed with a large excess of formaldehyde and a catalyst and heated for about one hour. The mixture is cooled to 50° C. and the catalyst neutralised if alkaline. The resin is separated, heated to 100° C., moulded, and then heated to harden it. The product is not brittle and its colour may be white. The catalyst employed may be calcined magnesia, sodium carbonate, or sodium borate, and when alkaline is subsequently neutralised with hydrochloric, acetic, or boric acid. A small quantity of paraffin or casein may be added to render the product more elastic.

292,660. Copper Compounds of Substantive Azo Dyestuffs, Manufacture of. W. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 18, 1927.

The dyestuffs employed are those obtained from a diazo compound or a diazoazo compound of such monoamines or their derivatives as contain in the *o*-position to the amino group at least one unsubstituted or substituted alkyloxy, aralkyloxy, or aryloxy group, and these are treated with a compound yielding copper, the products being very fast to light, to alkali, and to ironing. Dyestuffs which contain in the molecule the *o*-alkoxyazo group at the same time as the *o*-oxyazo or *o*-carboxy-azo groups derived from the diazo components are excluded. Examples of the azodyestuffs treated include those from 2-aminoanisol and 5 : 5^1-dioxy-2 : 2^1-dinaphthylamine 7 : 7^1-disulphonic acid; 4-nitro-2-aminoanisol and 5 : 5^1-dioxy-2 : 2^1-dinaphthylamine-7 : 7^1-disulphonic acid; 5-nitro-2-amino-anisol-4-sulphonic acid and 2-phenylamino-5-oxynaphthalene-7-sulphonic acid; 2-aminophenol-benzylether and 5 : 5^1-dioxy-2 : 2^1dinaphthylurea-7 : 7^1-disulphonic acid; 2-aminophenetol and 5 : 5^1-dioxy-2 : 2^1-dinaphthylamine-7 : 7^1-disulphonic acid; 2-aminophenoxy-acetic acid and 5 : 5^1-dioxy-2 : 2^1-dinaphthylamine-7 : 7^1-disulphonic acid; 2-amino-1-oxybenzene-glycolether and 5 : 5^1-dioxy-2 : 2^1-dinaphthylamine-7 : 7^1-disulphonic acid; and a large number of analogous dyestuffs. The shades obtained are stated in each case.

292,669. Absorbing Hydrogen Sulphide or Hydrogen Sulphide and Ammonia from Gases, Process for. W. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 21, 1927.

Ammonia and hydrogen sulphide have been absorbed from gases by compounds such as ammonium polythionates or ammonium thiosulphate and sulphuric acid, but the absorption capacity of these solutions is insufficient. In this invention the absorption is improved by separating the ammonia from the gas before the absorption process, and washing the gas in two stages with polythionate solution, the ammonia being introduced in the second stage. Part of the hydrogen sulphide is removed in the first stage by washing with a thiosulphate solution with the addition of sulphurous acid or gases containing sulphur dioxide. The thiosulphate solution contained in the polythionates is added to the second washing stage. In the second stage may be employed the neutral or weakly alkaline solution obtained by adding the ammonia separated before the washing process.

292,741. Vat Dyestuffs, Manufacture of. O. Y. Imray, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, May 5, 1927.

Specification No. 201,786 (see The Chemical Age, Vol. IX, p. 265) describes a dyestuff obtained by condensing perylenetetracarboxylic acid with ortho-phenylenediamine, but its leuco compound is only slightly soluble, and it is not suitable for dyeing purposes. Specification No. 248,519 (see The Chemical Age, Vol. XIV, p. 361) describes the soluble vat dyestuff obtained by condensing tetra-chloroperylene-tetracarboxylic acid with orthophenylenediamine, but this is not fast to soaping or boiling with sodium carbonate. In this invention these disadvantages are avoided by using for the condensation those halogenated perylenetetracarboxylic acids which contain only 1–3 halogen atoms. An example describes the condensation of dichloroperylene-tetracarboxylic acid with ortho-phenylene-diamine, yielding a dyestuff giving a violet colour on cotton.

292,749. HYDROCYANIC ACID FROM FORMAMIDE, PRODUCTION OF. Synthetic Ammonia and Nitrates, Ltd., Billingham, Stockton-on-Tees, and T. Ewan, 86, Shuna Street, Maryhill, Glasgow. Application date, May 21, 1927.

In the transformation of formamide vapour into hydrocyanic acid by passing it over a catalyst at a high temperature, it is desirable to operate for an optimum time of contact of the gases with the catalyst, and at an optimum temperature. These conditions are obtained by effecting internal heating of the reaction gases by means of an electrically heated gauze which may consist of a catalytic metal such as copper, brass or phosphor bronze, or the gauze may surround or precede the catalyst, or it may be coated with refractory oxides. Supplementary external heating may also be employed to reduce the cost.

292,896–7. DYESTUFFS OF THE ANTHRAQUINONE SERIES, PROCESS FOR THE MANUFACTURE OF. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 18, 1927.

292,896. When 1-hydroxyanthraquinone is fused with caustic alkali a brownish yellow condensation product is obtained which gives a slightly soluble sodium salt with caustic soda solution, and a leuco compound more soluble in alkalies with sodium hydrosulphite and caustic soda solution. It is now found that a better yield is obtained, and of higher purity, by conducting the alkali melt in the presence of organic solvents such as alcohol or aniline, and it is an advantage to conduct the reaction in an atmosphere of nitrogen. The crude product can be fractionated with sulphuric acid, or it may be treated with oxidising agents as described in Specification No. 292,897 below. Examples are given of the treatment of 1-hydroxyanthraquinone, 1-hydroxy-4-aminoanthraquinone, and 1-hydroxy-4-methoxy-anthraquinone, including the purification of the crude products.

292,897. The products obtained in Specification No. 292,896 above are purified by treating with oxidising agents such as hypochlorites, manganates, etc., or this treatment may be carried out after fractionation by means of sulphuric acid. Some examples are given.

NOTE.—Abstracts of the following specifications, which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention: —268,754 (I.G. Farbenindustrie Akt. Ges.,) relating to metallic compounds of *o*-hydroxy-azo dyestuffs, see Vol. XVI, p. 558; 271,863 (I.G. Farbenindustrie Akt.-Ges.) relating to preservation of rubber latex, see Vol. XVII, p. 134; 271,884 and 272,225 (I.G. Farbenindustrie Akt.-Ges.) relating to anthraquinonyl ketones, see Vol. XVII, p. 134; 272,556 (I.G. Farbenindustrie Akt.-Ges.) relating to low-boiling hydrocarbons from coal, tars, mineral oils, etc., see Vol. XVII, p. 173; 282,779 (Q. Marino) relating to detinning processes, see Vol. XVIII, p. 39 (Metallurgical Section); 284,322 (American Cyanamid Co.) relating to an ammonium phosphate fertiliser composition, see Vol. XVIII, p. 326.

International Specifications not yet Accepted

290,971. PHOSPHORUS AND FERRO-SILICON. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, May 21, 1927.

Ferro-phosphorus is fused in an electric furnace with silicon, or silica and coke or carbon in such proportions that a commercial ferro-silicon is obtained and phosphorus is liberated, drawn off with inert gases and condensed.

290,986. METAL SULPHIDES. K. Brodowski, 29, Maxstrasse, Schöneberg, Berlin. International Convention date, May 21, 1927.

Copper, iron or lead sulphides are formed by heating the metal with sulphur under pressure by passing an electric current through it, and the sulphide is forced into moulds during the heat treatment.

290,992. ALIPHATIC ACIDS. Distilleries des Deux-Sèvres, Melle, Deux-Sèvres, France. International Convention date, May 23, 1927. Addition to 273,744. (See THE CHEMICAL AGE, Vol. XVII, p. 242.)

Specification 273,744 describes the extraction of aliphatic acids from their aqueous solutions by means of an acetic ester. In this process, the acetic ester is mixed with a hydrocarbon such as benzene, toluene, xylene, or petroleum fractions similar to petrol—*e.g.*, ethyl acetate 75 parts, benzene 25 parts.

290,997. 1-OXYETHYLAMINO-4-OXYBENZENES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, May 23, 1927. Addition to 280,873.

4-Amino-1-oxybenzene is condensed with ethylene oxide at ordinary or raised temperature and pressure in the presence of a diluent and/or a catalyst to obtain mono- and di-N-oxyethyl derivatives. If calcium carbonate or caustic soda is used as catalyst, the di-N-oxyethyl-4-amino-1-oxybenzene is obtained. The mono-N-oxyethyl derivative is obtained by passing ethylene oxide into a suspension of 4-amino-1-oxybenzene in water containing concentrated sulphuric acid and mercuric acetate till traces of the dioxyethyl derivative are found. The mono-N-oxyethyl derivative is obtained as sulphate.

291,004. TREATING ORES. Deutsche Gasglühlicht Aner-Ges., 16, Rotherstrasse, Berlin. International Convention date, May 23, 1927.

Titanium and zirconium ores are treated with sulphuric acid, and the sulphates roasted to the oxides. Further quantities of ores are treated with the sulphur dioxide and trioxide obtained by the roasting, together with air or oxygen, and the sulphatizing completed with sulphuric acid.

291,100. AROMATIC POLYSULPHIDES. R. Eder, 144, Freudenbergstrasse, Zurich, Switzerland. International Convention date, May 27, 1927.

Polysulphides in which two aromatic nuclei, each containing a carboxylic group, are connected by a bridge of sulphur atoms, are obtained by treating aromatic mercapto-carboxylic acids or esters with sulphur halides. Dihalides yield trisulphides, and monohalides yield tetrasulphides. Alternatively, the mercapto-carboxylic acids may be treated with sulphur halides and then esterified. The sulphur halide reaction is preferable in the presence of ether, chloroform, acetone, methylene chloride, or petroleum ether. Examples are given of the production of dibenzoic acid-3 : 3^1-tri- and tetra-sulphide, dibenzoic acid ethyl ester-3 : 3^1-tri- and tetra-sulphide, disalicylic acid-5 : 5^1-tri- and tetra-sulphide, disalicylic ethyl ester-5 : 5^1-tri- and tetra-sulphide by alternative methods.

LATEST NOTIFICATIONS.

293,792. Manufacture of 4-amino-1-oxybenzene and N-derivatives thereof. I.G. Farbenindustrie Akt.-Ges. July 12, 1927.

293,749. Manufacture of finely subdivided metals. I.G. Farbenindustrie Akt.-Ges. July 11, 1927.

294,104. Manufacture of anti-halation coatings. I.G. Farbenindustrie Akt.-Ges. July 16, 1927.

293,863. Process for the manufacture of 3-methyl-6-isopropylene-phenol. Schering-Kahlbaum Akt.-Ges. July 14, 1927.

293-795. Manufacture of dyestuff preparations. Soc. of Chemical Industry in Basle. July 12, 1927.

293,755. Apparatus for making hydrogen peroxide by distillation of persulphuric acid and persulphate solutions and for the concentration of hydrogen peroxide solutions. Oesterreichische Chemische Werke Ges. July 11, 1927.

293,833. Process for removing sulphur from articles made from viscose. I.G. Farbenindustrie Akt.-Ges. July 13, 1927.

293,757. Manufacture of esters of carbohydrates of the type $(C_6H_{10}O_5)$. I.G. Farbenindustrie Akt.-Ges. July 11, 1927.

294,106. Recovery of ammonia and other products. Barrett Co. July 16, 1927.

293,834. Production of metal plates and sheets for offset-printing. I.G. Farbenindustrie Akt.-Ges. July 13, 1927.

293,763. Process for the continuous production of alkylene oxides from alkylene chlorhydrins. Goldschmidt Akt.-Ges. July 11, 1927.

293,766. Process for dyeing ethers or esters of cellulose or transformation products thereof. I.G. Farbenindustrie Akt.-Ges. July 11, 1927.

293,768. Manufacture of cycloketones, polycycloketones, and quinones. I.G. Farbenindustrie Akt.-Ges. July 11, 1927.

293,806. Manufacture of sulphonated linseed oil. Oranienburger Chemische Fabrik Akt.-Ges. July 12, 1927.

293,807. Mechanical washers or scrubbers. I.G. Farbenindustrie Akt.-Ges. July 12, 1927.

294,117. Manufacture of nitrophosphates. Elektrizitätswerk Lonza. July 14, 1927.

294,118. Manufacture of basic derivatives of substituted quinoline-carboxylic acids. Soc. of Chemical Industry in Basle. July 15, 1927.

Specifications Accepted with Date of Application

267,554. Ammonia, Synthetic Manufacture of. I.G. Farbenindustrie Akt.-Ges. March 13, 1926.

268,796. Conversion of Hydrocarbons of high boiling point into compounds of lower boiling point. I.G. Farbenindustrie Akt.-Ges. April 1, 1926.

268,830. Benzanthrones, Manufacture of. I.G. Farbenindustrie Akt.-Ges. April 3, 1926.

269,521. Liquid hydrocarbons, Production of. I.G. Farbenindustrie Akt.-Ges. April 14, 1926.

269,918. Dyestuffs, Manufacture of. I.G. Farbenindustrie Akt.-Ges. April 22, 1926.

270,763. Highly porous coherent lead aggregates, Manufacture of. I.G. Farbenindustrie Akt.-Ges. May 7, 1926.

273,712. Liquid products, Manufacture and production of, by the destructive hydrogenation of coal, tars, mineral oils, and the like. I.G. Farbenindustrie Akt.-Ges. June 29, 1926.

280,492. Orange vat dyestuffs of the anthraquinone series, Manufacture and production of. I.G. Farbenindustrie Akt.-Ges. Nov. 15, 1926.

282,619. Soluble phosphatic fertilizers, Method of producing. F. G. Liljenroth. December 23, 1926.

285,394. Inactive menthol, Production of. Rheinische Kampfer-Fabrik Ges. February 15, 1927.

293,363. Metallo-mercapto compounds, Manufacture of. K. Carpmael and K. S. Carpmael. (*Chemische Fabrik auf Actien (vorm E. Schering)*). February 2, 1927.

293,340. Extraction of metals from ores. P. R. Blamey. April 2, 1927.

293,480. Treating oils or fats or mixtures of the same or fatty acids for the production of sulphuric acid compounds. E. C. R. Marks. (*Chemische Fabrik Stockhausen & Cie.*). April 6, 1927.

293,326. Steel, Manufacture of, in the Siemens-Martin furnace. F. Siemens Akt.-Ges., R. Durrer, F. C. Siemens and A. Sprenger. December 24, 1926.

293,328. Dyestuffs and intermediates. H. W. Hereward, J. Thomas and Scottish Dyes, Ltd. December 29, 1926.

293,413. Gases, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). April 2, 1927. Addition to 214,544.

293,410. Anhydrous chlorides free from oxides, Production of. A. L. Mond. (*I.G. Farbenindustrie Akt.-Ges.*). April 6, 1927.

293,411. Apparatus for concentrating minerals. F. L. Wilder, E. Morris, E. Schiff, and E. S. King. April 6, 1927.

293,487. Polymerisation of ethylene, propylene and butylene. F. Hofmann and M. Otto. April 8, 1927.

293,494. Chromium oxide and chromium hydroxide, Manufacture of. K. Carpmael and K. S. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*). April 12, 1927.

293,504. Colloidal iodine and the process of making the same. R. W. James (*Merck and Co.*). April 20, 1927.

293,572. Gaseous hydrocarbons from gas mixtures containing hydrogen and oxides of carbon, Production of. J. Y. Johnson (*I.G. Farbenindustrie Akt.-Ges.*). July 13, 1927.

293,592. Treatment of gases for the removal of hydric sulphide and carbonic acid. M. Aurig and G. Brücklmayr. August 24, 1927.

293,617. Derivative of acridine, Manufacture of. A. G. Green. November 2, 1927.

Applications for Patents

Askenasy, P. Manufacture of hydrogen peroxide. 21,200. July 21. (France, July 21, 1927.)

British Cyanides Co., Ltd. Manufacture of artificial resins, etc. 21,176. July 21.

Brockbank, J. G., and Continuous Coal Carbonisation, Ltd. Carbonisation of coal. 20,901. July 18.

Budd Manufacturing Co., E. G. Urea-formaldehyde condensates. 21,015, 21,016. July 19. (United States, July 21, 1927.)

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of primary alcohols. 20,734. July 17.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of sulphur dyestuffs. 20,890. July 18.

Clarke, S. J. Domestic stoves, etc. 20,848. July 18.

Clayton Aniline Co., Ltd. Manufacture of condensation products. 21,104. July 20.

Clayton Aniline Co., Ltd. Products for manufacture of vulcanised rubber. 21,105. July 20.

Coley, H. E. Distillation process for zinc oxides. 20,727. July 17.

Dunworth, J. F., Scottish Dyes, Ltd., and Thomas, J. Production of dyestuffs, etc. 20,632. July 16.

Elektrizitätswerk Lonza. Manufacture of nitrophosphates. 20,611 July 16. (Switzerland, July 14, 1927.)

Golding, H. D., Hirst, H. S., Imperial Chemical Industries, Ltd., Leicester, F.D., and Rowell, S. W. Production of acetic acid. 20,819. July 18.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Process for recovery of tar. 20,589. July 16.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of products resembling wax. 20,590. July 16.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Production of anthraquinone carboxylic acids, etc. 20,591. July 16.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of fuel gas. 20,842. July 18.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Refining crude paraffin wax. 20,982. July 19.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Separation of mixtures. 21,114. July 20.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Elimination of sulphur dioxide from gases. 21,115. July 20.

I.G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Separation of visible rays from ultra-violet rays. 21,116. July 20.

I.G. Farbenindustrie Akt.-Ges. Production of hydrocarbons. 20,588. July 16. (Germany, September 1, 1927.)

I.G. Farbenindustrie Akt.-Ges. Production of magnesium by fusion electrolysis. 20,971. July 19. (Germany, February 15).

I.G. Farbenindustrie Akt.-Ges. Cameras. 21,000. July 19. (United States, July 19, 1927.)

I.G. Farbenindustrie Akt.-Ges. Purification of metallic salt solutions. 21,134. July 20. (Germany, July 21, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of thio-semicarbazones of arsenophenol-aldehydes, etc. 21,187. July 21. (Germany, July 21, 1927.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of silica acid solutions. 21,188. July 21. (Germany, July 21, 1927.)

Imperial Chemical Industries, Ltd. Production of fertilisers. 20,931. July 19.

Kalle and Co. Akt.-Ges. Manufacture of light-sensitive materials. 20,597. July 16. (Germany, July 21, 1927.)

Kalle and Co. Akt.-Ges. Manufacture of solid stable diazo compounds. 20,598. July 16. (Germany, July 21, 1927.)

Metallbank und Metallurgische Ges. Akt.-Ges. Production of white lead. 20,729. July 17.

Soc. of Chemical Industry in Basle. Manufacture of basis derivatives of substituted quinoline-carboxylic acids. 20,612. July 16 (Switzerland, July 15, 1927.)

Wilson, W. Production of ammonium carbonates. 21,063. July 20.

Light Drums for Chemicals

AMONG different varieties of metal containers the Power Engineering Co., Ltd., of Manchester, make drums for use in the chemical industry. These can be supplied in varying capacities with either solid shrunk on, corrugated or pressed out roller bands. The Fortis light shipper drum (illustrated) is supplied

THE FORTIS LIGHT SHIPPER DRUM.

in capacities of 25, 40, 45 and 50 gallons and the seams are welded throughout, the chimbs being stiffened by corrugating. The reinforced shipper drum is a stronger article in a greater range of capacities. The " Power " roller hoop drum is a strong welded drum with shrunk-on hoops.

British Balances

NEARLY 80 years ago (in 1849), the late Mr. L. Oertling founded the firm which has become famous for the construction of precision balances, and is now known as L. Oertling, Ltd., of London. The firm has just issued a catalogue which is prefaced by an interesting note on its history, and in which are given detailed notes of the numerous balances made. In some cases balances have been specially designed for special purposes. Among products of unusual interest are the " Chainomatic " balance; the precision torsion balance, for rapidly weighing very light objects with extreme accuracy; and the micro-chemical balance.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages extra.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 3d. to 1s. 8d. per gall.; pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised, 2s. 4d. to 2s. 8d. per gall.; 64 O.P., 1d. extra in all cases.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6¼d. to 6¾d. per lb. Crude 60's, 2s. 2d. to 2s. 4d. per gall. prompt.

ACID CRESYLIC 99/100.—2s. 7d. to 3s. per gall. 97/99.—2s. 6d. to 2s. 7d. per gall. Pale, 95%, 2s. 3d. to 2s. 5d. per gall. Dark, 2s. 1d. to 2s. 3d.

ANTHRACENE.—A quality, 2½d. per unit. 40%, £5 per ton.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7¾d. to 8d. per gall.

BENZOLE.—Prices at works: Crude, 10½d. to 11d. per gall.; Standard Motor, 1s. 4½d. to 1s. 5d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall.; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 6d. to 2s. 9d. per gall. Firm. Pure, 1s. 10d. to 3s. per gall.

XYLOL.—1s. 3d. to 1s. 11d. per gall. Pure, 2s. 3d. per gall.

CREOSOTE.—Cresylic, 20/24%, 9d. per gall.; middle oil, 7d. to 8d. per gall. Heavy, 7⅞d. to 8¼d. per gall. Standard specification, 6¾d. to 7d. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8½d. to 9d. per gall. Solvent 90/160, 1s. 1d. to 1s. 2½d. per gall. Solvent 95/160, 1s. 2d. to 1s. 7d. per gall. Solvent 90/190, 11d. to 1s. 4d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £4 to £5 per ton. Whizzed, £8 per ton. Hot pressed, £8 10s. to £9 per ton.

NAPHTHALENE.—Crystals, £13 to £14 10s. per ton. Quiet. Flaked, £13 to £15 per ton, according to districts.

PITCH.—Medium soft, 51s. to 57s. 6d. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 5s. to 6s. per gall. 90/180, 3s. to 4s. per gall. Heavy, 2s. 6d. to 3s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100 %.

ACID BENZOIC.—1s. 8½d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 3d. to 2s. 6d. per lb.

p-CRESOL 32/34° C.—2s. 3d. to 2s. 6d. per lb.

DICHLORANILINE.—2s. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITHROBENZENE.—8½d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—1s. 10d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £10 5s. per ton. Good demand. Grey, £14 10s. to £15 per ton. Liquor, 9d. per gall.

CHARCOAL.—£6 to £9 per ton, according to grade and locality. Foreign competition severe.

IRON LIQUOR.—1s. 3d. per gall, 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10d. per gall.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 11d. to 4s. 3d. per gall. Solvent, 4s. 3d. per gall.

WOOD TAR.—£4 to £5 per ton.

BROWN SUGAR OF LEAD.—£40 15s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 5½d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 6d. to 2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £50 per ton, according to quantity. drums extra.

CHROMIUM OXIDE, GREEN.—1s. 1d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPHONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. to 6s. 3d. per lb.

ZINC SULPHUR.—1s. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 6d. to 2s. 8d. per lb.

ACID, BENZOIC, B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. to 1s. 4d. per oz., according to quantity.

ACID, BORIC B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 10½d. to 1s. 11d. per lb. Less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 6d. per lb. Technical.—10½d. to 11½d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 4½d. to 1s. 5d. per lb., less 5%.
ACETANILIDE.—1s. 5d. to 1s. 8d. per lb. for quantities.
AMIDOL.—7s. 6d. to 9s. per lb., d/d.
AMIDOPYRIN.—8s. to 8s. 3d. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity. 18s. per lb. ex Gum.
AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
ATROPINE SULPHATE.—9s. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. 3d. per lb. spot.
BISMUTH CARBONATE.—9s. 9d. per lb.
BISMUTH CITRATE.—9s. 3d. per lb.
BISMUTH SALICYLATE.—8s. 9d. per lb.
BISMUTH SUBNITRATE.—8s. 3d. per lb.
BISMUTH NITRATE.—Cryst. 5s. 9d. per lb.
BISMUTH OXIDE.—12s. 3d. per lb.
BISMUTH SUBCHLORIDE.—10s. 9d. per lb.
BISMUTH SUBGALLATE.—7s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts., 11d. per lb.
BORAX B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Ammonium, 2s. 1d. to 2s. 3d. per lb.; potassium, 1s. 9½d. to 1s. 11d. per lb.; sodium, 2s. to 2s. 2d. per lb.; granulated, ½d. per lb. less; all spot. Large quantities at lower rates.
CALCIUM LACTATE.—B.P., 1s. 2d. to 1s. 4d. per lb.
CAMPHOR.—Refined flowers, 2s. 11d. to 3s. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 2d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 4½d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—11d. to 1s. 0d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE.—£39 per ton, in barrels ex wharf.
GUAIACOL CARBONATE.—4s. 9d. to 5s. per lb.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.
HYDROQUINONE.—3s. 9d. to 4s. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28 lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
IRON AMMONIUM CITRATE.—B.P., 2s. 6d. to 2s. 9d. per lb. Green, 2s. 9d. to 3s. 2d. per lb.; U.S.P., 2s. 7d. to 2s. 10d. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8½d. to 9½d. per oz.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.
MENTHOL.—A.B.R. recrystallised B.P., 20s. per lb. net for January delivery; Synthetic, 9s. to 10s. per lb.; Synthetic detached crystals, 9s. to 12s. 6d. per lb., according to quantity; Liquid (95%), 9s. 6d. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, 7s. 6d. to 7s. 7d. per lb., levig., 7s. to 7s. 1d. per lb.; Corrosive Sublimate, Lump, 5s. 9d. to 5s. 10d. per lb., Powder, 5s. 2d. to 5s. 3d. per lb.; White Precipitate, Lump, 5s. 11d. to 6s. per lb., Powder, 6s. to 6s. 1d. per lb., Extra Fine, 6s. 1d. to 6s. 2d. per lb.; Calomel, 6s. 4d. to 6s. 5d. per lb.; Yellow Oxide, 6s. 10d. to 6s. 11d. per lb.; Persulph., B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 5s. 10d. to 5s. 11d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 5d. to 1s. 9d. per lb.
METHYL SULPHONAL.—9s. to 9s. 3d. per lb.
METOL.—9s. to 11s. 6d. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.
PARALDEHYDE.—1s. 1d. to 1s. 4d. per lb.
PHENACETIN.—2s. 6d. to 2s. 9d. per lb.
PHENAZONE.—4s. to 4s. 3d. per lb.
PHENOLPHTHALEIN.—6s. to 6s. 3d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—98s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P.C., 2s. 4d. to 2s. 7d. per lb.; U.S.P., 2s. 3d. to 2s. 6d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb., according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.
RESORCIN.—2s. 10d. to 3s. per lb., spot.
SACCHARIN.—47s. per lb.; in quantity lower.
SALOL.—2s. 4d. per lb.
SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.
SODIUM CITRATE, B.P.C., 1911—2s. 1d. to 2s. 4d. per lb., B.P.C. 1923—2s. 5d. to 2s. 6d. per lb. U.S.P., 2s. 4d. to 2s. 7d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—95s. to 100s. per cwt. Crystals, 4s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 6d. to 1s. 9d. per lb. Crystal, 1s. 8d. to 1s. 10d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 1d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—6s. 9d. to 7s. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. 1d. to 2s. 2d. per lb.
THYMOL.—Puriss., 9s. 6d. to 9s. 9d. per lb., according to quantity. Firmer. Natural, 14s. 3d. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—10s. per lb.
AMYL ACETATE.—2s. 6d. per lb.
AMYL BUTYRATE.—4s. 9d. per lb.
AMYL SALICYLATE.—2s. 9d. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 3d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL—2s. per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—15s. 6d. per lb.
COUMARIN.—9s. 6d. per lb.
CITRONELLOL.—13s. 6d. per lb.
CITRAL.—8s. 3d. per lb.
ETHYL CINNAMATE.—6s. per lb.
ETHYL PHTHALATE.—2s. 6d. per lb.
EUGENOL.—10s. 6d. per lb.
GERANIOL (PALMAROSA).—23s. per lb.
GERANIOL.—6s. 6d. to 11s. per lb.
HELIOTROPINE.—4s. 9d. per lb.
ISO EUGENOL.—14s. 6d. per lb.
LINALOL.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 10s. 6d. per lb.
LINALYL ACETATE.—Ex Shui Oil, 14s. 6d. per lb. Ex Bois de Rose, 18s. 6d. per lb.
METHYL ANTHRANILATE.—8s. 6d. per lb.
METHYL BENZOATE.—4s. per lb.
MUSK KETONE.—35s. per lb.
MUSK XYLOL.—7s. per lb.
NEROLIN.—3s. 6d. per lb.
PHENYL ETHYL ACETATE.—11s. per lb.
PHENYL ETHYL ALCOHOL.—10s. 6d. per lb.
RHODINOL.—38s. per lb.
SAFROL.—1s. 6d. per lb.
TERPINEOL.—1s. 6d. per lb.
VANILLIN.—16s. 6d. per lb.

Essential Oils

ALMOND OIL.—Foreign S.P.A., 10s. 6d. per lb.
ANISE OIL.—2s. 9d. per lb.
BERGAMOT OIL.—26s. per lb.
BOURBON GERANIUM OIL.—20s. per lb.
CAMPHOR OIL.—9d. per lb.
CANANGA OIL, JAVA.—12s. per lb.
CINNAMON OIL LEAF.—6s. 9d. per oz.
CASSIA OIL, 80/85%.—7s. 6d. per lb.
CITRONELLA OIL.—Java, 2s. 1d. per lb., c.i.f. U.K. port. Ceylon, pure, 1s. 11d. per lb.
CLOVE OIL (PURE 90/92%).—7s. 3d. per lb.
EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.—2s. 1d. per lb.
LAVENDER OIL.—Mont Blanc, 48/50%, Esters, 15s. 9d. per lb.
LEMON OIL.—13s. per lb.
LEMONGRASS OIL.—4s. 3d. per lb.
ORANGE OIL, SWEET.—30s. per lb.
OTTO OF ROSE OIL.—Anatolian, 35s. per oz. Bulgarian, 75s. per oz.
PALMA ROSA OIL.—13s. 9d. per lb.
PEPPERMINT OIL.—Wayne County, 14s. 6d. per lb.; Japanese, 7s. 6d per lb.
PETITGRAIN.—7s. 3d. per lb. Sandalwood, Mysore, 26s. 6d. per lb., 90/95%, 16s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, July 26, 1928.

TRADE this week has been on the dull side, owing in the main to the usual seasonal influences. Prices, however, continue extremely firm and there are practically no changes to report. Export trade is better.

General Chemicals

ACETONE.—Unchanged in value from £65 to £67 per ton; demand fair.

ACID ACETIC.—Unchanged at convention figures.

ACID FORMIC is extremely firm at £47 per ton for 85% quality with fair demand.

ACID LACTIC.—Moderate business is reported on the basis of £43 per ton for pale quality 50% by weight.

ACID OXALIC continues active at £31 to £33 per ton according to quantity and position.

ACID TARTARIC.—No change here is reported but the market is held at the price of 1s. 4d. to 1s. 4¼d. per lb.; demand, considering the season only moderate.

AMMONIUM CHLORIDE is slightly better in demand, but the price shows no reaction and is still quoted as £19 per ton for fine crystals.

ALUMINA SULPHATE continues active and the price is well maintained at £6 10s. per ton for 17/18% quality technically free from iron.

ARSENIC.—There is nominally no change in the market, although some business has been received. With any inquiry it is quite certain that there would be a quick response in the market quotation.

BARIUM CHLORIDE continues extremely firm at £9 to £9 5s. per ton, ex store; is short and in good demand.

COPPER SULPHATE.—Considering the season has been fairly active. Price may be placed at round about £23 per ton net f.o.b.

CREAM OF TARTAR.—This market also is unchanged and the figure mentioned is still £103, less 2½%, for 99/100% B.P. quality.

FORMALDEHYDE has been very active, but price is still unchanged at £39 10s. to £40 10s. for 40% by volume.

LEAD ACETATE.—Price well maintained, with demand good at £42 10s. and £41 per ton respectively for white and brown.

LEAD NITRATE has been a better market and is unchanged at £37 per ton.

LIME ACETATE has been in better request and the price is unchanged.

METHYL ACETONE.—Only moderate business is reported at the price of £56/£58 per ton for 45% material.

POTASSIUM CARBONATE AND CAUSTIC.—Unchanged; business only moderate.

POTASSIUM CHLORATE.—Fairly active at £28 per ton with a higher tendency.

POTASSIUM PERMANGANATE.—Quite fair business continues to be done on the basis of 5¼d. per lb. for B.P., with the commercial quality at ½d. per lb. less.

POTASSIUM PRUSSIATE.—Unchanged at £62 10s. to £65 10s., according to quantity and position.

SODIUM ACETATE.—Demand is better and the price is extremely firm at £21 to £22 per ton.

SODIUM PHOSPHATE continues active and the price is quoted at £13 to £13 5s. per ton, ex store.

SODIUM PRUSSIATE is unchanged at 4¾d. to 5d. per lb. according to quantity and position.

SODIUM SULPHIDE.—Unchanged at British makers' figures.

TARTAR EMETIC continues active and makers are well sold ahead. Only a very small quantity of material is now available at 11¾d. per lb.

ZINC SULPHATE has also been fairly brisk at the last quoted price of £12 per ton.

Coal Tar Products

THE market for coal tar products is still fairly quiet, and there is little change to report in the prices from last week.

MOTOR BENZOL remains at about 1s. 4d. per gallon on rails.

SOLVENT NAPHTHA is slightly weaker at 1s. 1d. to 1s. 1¼d. per gallon, on rails.

HEAVY NAPHTHA is unchanged at 1s. 1d. to 1s. 2d. per gallon, on rails.

CREOSOTE is slightly weaker; can be bought at about 6¼d. per gallon on rails in the North, and 6¾d. per gallon in London.

CRESYLIC ACID.—The 98/100% quality can be bought in small quantities at 2s. 4d. per gallon f.o.b., and the dark quality remains at about 1s. 10d. to 1s. 11d. per gallon f.o.b. naked.

NAPHTHALENE is unchanged, the 74/76 quality being quoted at £5 per ton, and the 76/78 quality at £6 to £6 10s. per ton.

PITCH.—There are no new features to report. The value remains at about 60s. to 65s. f.o.b. U.K. port.

Latest Oil Prices

LONDON, July 25.—LINSEED OIL closed quieter at a net advance of 2s. 6d. to 7s. 6d. per ton, as to position. Spot, ex mill, £28 15s.; July, £27 12s. 6d.; August, £27 17s. 6d.; September-December, £28 2s. 6d.; January-April, £28 15s.; and May-August, £29 5s., naked. RAPE OIL quiet. Crude extracted, £41; technical refined, £43, naked, ex wharf. COTTON OIL slow. Egyptian crude, £34; refined common edible, £39 10s.; and deodorized, £41 10s. per ton, naked. TURPENTINE quiet and 3d. per cwt. lower. American spot, 43s. 3d.; August, 43s. 6d.; and September-December, 44s. 3d.

HULL, July 25.—LINSEED OIL. Spot to August, £28 5s.; September-December, £28 7s. 6d.; January-April, £28 17s. 6d.; per ton, naked. COTTON OIL. Bombay crude, £30; Egyptian crude, £32; edible refined, £36 10s.; technical, £34; deodorized, £38 10s. per ton, naked. PALM KERNEL OIL. Crushed, 5½ per cent., £38 10s, per ton, naked. GROUNDNUT OIL. Crushed-extracted, £39; deodorised, £43 per ton. SOYA OIL. Extracted and crushed, £33; deodorised, £36 10s. per ton. RAPE OIL. Crude-extracted, £40 15s.; refined, £42 15s. per ton. TURPENTINE. Spot, 45s. 6d. per cwt., net cash terms, ex mill. CASTOR OIL and COD OIL unchanged.

Nitrogen Products

Export.—The demand for export has been satisfactory, and the price has advanced to £9 3s. 6d. per ton, f.o.b. U.K. ports in single bags. Considerable buying has been reported from the Far East. The European market continues quiet.

Home.—The home market is dull, as producers have given no indication of the new scale of prices to be announced at the end of the month.

Nitrate of Soda.—The nitrate market continues unchanged at about 16s. 4d. per metric quintal f.a.s. Chile. Sales for delivery since July 1 last now exceed 500,000 tons. At the moment merchants are not hastening to cover their season's requirements.

Calcium Cyanamide 20.6% N

As recently announced, supplies of this fertiliser are now sold on a guarantee of 20.6 per cent. nitrogen instead of 19 per cent. as hitherto. Inquiries for this higher grade material have been distinctly encouraging, and a fairly keen demand is already being experienced for application in autumn. The farmers' price for August delivery, for 4-ton lots, will be £9, carriage paid to any railway station in Great Britain.

South Wales By-Products

THERE is no change in any section of South Wales by-product activities, the market being quite featureless. There have been small transactions in pitch round the 55s. to 60s. per ton delivered mark, while refined tars continue to have a steady, moderate demand, with values unchanged. Crude tar has small inquiries round about 55s. to 60s. per ton, f.o.r. maker's works. Patent fuel and coke exports are slightly better, but they are still far from satisfactory. Oil imports into Swansea over the last four weeks amounted to 34,871,947 gallons.

A PAMPHLET entitled "Safeguarding Your Property" has been issued by Foamite Firefoam, Ltd., of 55–57, Great Marlborough Street, London, W. This deals generally with methods of fire extinction, and indicates the methods applicable in different cases. Apparatus and plant for use, both on the large and small scale, is described.

SALES OF NITRATE OF SODA reported by the Producers' Association from the introduction of free selling on April 14, 1927, to June 30 last, amounted to 3,656,605 metric tons, state the Anglo-South American Bank. These sales include 525,119 tons disposed of for delivery in 1928-29. Further sales have been effected during the current month at prices ranging from 16s. 4d. to 16s. 9d. per metric quintal.

BRITISH DRUG HOUSES, LTD., have just issued a new catalogue of their products, dated July, 1928. The list now covers 130 pages. Two recent introductions are B.D.H. immersion oil for microscopic use; and B.D.H. Ni-Kom outfit (nickel comparator), for the colorimetric estimation of nickel in nickel-plating baths, etc. A number of additions have been made to the list of organic and inorganic chemicals, which now covers 92 pages.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinion.

Glasgow, July 26, 1928.

THERE is still little activity in the Scottish heavy chemical market, most of the consuming works still being closed until the beginning of next week. Prices are on about the same level as last report.

Industrial Chemicals

ACETONE, B.G.S.—£64 to £67 per ton, ex store, according to quantity.

ACID ACETIC.—98/100%, glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 10s per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton; powder, £32 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—Quoted 6½d. per lb., delivered or f.o.b. U.K. ports.

ACID CITRIC, B.P.—Offered for spot delivery at 1s. 11d. per lb., less 3%, ex store. Quoted 1s. 10¾d. per lb., less 5%, ex wharf to come forward.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC.—80° quality, £24 10s. per ton, ex station, full truck loads.

ACID OXALIC.—98/100%, on offer from the Continent at 3¼d. per lb., ex wharf. Spot material quoted 3½d. per lb., ex store. In better demand.

ACID SULPHURIC.—£2 15s. per ton, ex works for 144° quality; £5 15s. per ton for 168° quality. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Quoted 1s. 4½d. per lb., less 5%, ex wharf, but this price could probably be shaded.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Quoted £5 15s. per ton, c.i.f. U.K. ports, prompt shipment. Spot material available at about £5 15s. per ton, ex store.

ALUM, LUMP POTASH.—Quoted £8 7s. 6d. per ton, c.i.f. U.K. ports, prompt shipment from the Continent. Crystal meal quoted £8 10s. per ton, ex store.

AMMONIA, ANHYDROUS.—Quoted 9½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 80°.—Unchanged at about 2½d. to 3d. per lb. delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanizers crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—98/100% spot material available at about £44 per ton, ex store, but considerably cheaper prices are quoted for prompt shipment.

ARSENIC, WHITE POWDERED.—On offer for prompt despatch from mines at £19 per ton, ex wharf. Spot material quoted £20 per ton, ex store.

BARIUM CARBONATE, 98/100%.—English material on offer at £7 5s. per ton, ex store. Continental quoted £7 per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE.—Still scarce for spot delivery, and price round about £9 per ton, ex store named. Offer from the Continent about £7 15s. per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—British manufactures' contract price to consumers, £6 12s. 6d. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

CALCIUM CHLORIDE.—British manufacturers' price £4 5s. to £4 15s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports for export.

COPPER SULPHATE.—Now on offer from the Continent at about £23 15s. per ton, c.i.f. U.K. ports, but spot parcel of British material offered at about £23 per ton, ex store.

FORMALDEHYDE, 40%.—Quoted £35 10s. per ton, c.i.f. U.K. ports. Spot material now on offer at £38 per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material on offer at £31 per ton, ex store.

LEAD, WHITE.—£35 15s. to £37 per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals now quoted £41 15s. per ton, ex store. Brown on offer at about £40 per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. now quoted 1s. 4d. per gallon less 2% delivered.

POTASSIUM BICHROMATE.—4⅛d. per lb. delivered, minimum 4-ton lots. Under 4-ton lots, ⅛d. per lb. extra.

POTASSIUM CARBONATE, 96/98%.—Quoted £25 10s. per ton, c.i.f. U.K. ports. Crystals, 30s. per ton extra. B.P. quality crystals or powder offered at £32 per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¾/100%.—Powder rather cheaper and price named from continent now about £22 15s. per ton, c.i.f. U.K. ports. Crystals 20s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Rather scarcer for spot delivery and now 6⅝d. per lb., ex store. Offered from the Continent at 6¼d. per lb., ex wharf, prompt shipment.

SODA CAUSTIC.—Powdered 98/99%, £17 17s. 6d. per ton. Solid 76/77%, £14 10s. per ton; and 70/72%, £13 12s. 6d. per ton, minimum 4-ton lots, carriage paid on contract. Spot material, 10s. per ton extra.

SODIUM ACETATE.—Spot material on offer at about £22 per ton, ex store.

SODIUM BICARBONATE.—Refined re-crystallised, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less. No change in price for next year.

SODIUM BICHROMATE.—Quoted 3d. per lb. delivered buyers' works, minimum 4-ton lots. Under 4 and over 2-ton lots, 1/16d. per lb. Under 2-ton lots, 3⅛d. per lb.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality, 27s. 6d. per ton extra. Light soda ash, £7 3s. 0d. per ton ex quay, minimum 4-ton lots, with various reductions for contract.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minmum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots.

SODIUM NITRATE.—Quoted £11 per ton, ex store.

SODIUM NITRITE, 100%.—Quoted £19 10s. per ton, ex store.

SODIUM PRUSSIATE.—In moderate demand. Spot material now quoted 4¾d. per lb., ex store.

SODIUM SULPHATE (SALTCAKE).—Prices, 50s. per ton, ex works; 52s. 6d. per ton delivered for unground quality. Ground quality, 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption, solid 60/62%, £9 per ton, broken 60/62%, £10 per ton; crystals 30/32%, £7 2s. 6d. per ton, delivered. Buyers works on contract, minimum 4-ton lots. Special prices for some consumers. Spot material, 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 15s. per ton; rock, £10 12s. 6d. per ton; ground American, £9 5s. per ton, ex store. Prices nominal.

ZINC CHLORIDE.—British material 98/100%, quoted £24 15s. per ton, f.o.b. U.K. ports, 98/100% solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports. Powdered, 20s. per ton extra.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf, prompt shipment from the Continent.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

New Nitrate Process

THE German-owned "San Pedro" plant is installing new machinery for the manufacture of nitrate of soda under the "Banthien" process, which was developed in the German potash industry and recommended by the head of the research bureau of the Nitrate Producers' Association as adaptable to the Chilean industry. The patent rights of this new process for Chile have been purchased by German interests and a separate company formed for its development. The installation of the "Banthien" process at the "San Pedro" plant will be the first of its kind on a large scale. Experiments were made previously with a small pilot plant at "Oficina Pena Chica." Nearly all the machinery was imported from Germany and it was expected that operations would commence during May, 1928.

Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, July 26, 1928.

Inquiry for chemicals on the open market here during the past week has continued on relatively quiet lines, the result largely, of course, of seasonal influences. Apart from contract deliveries, which are proceeding on a fair scale, orders placed this week have for the most part been on prompt or early delivery account, and the quantities ordered have usually been small. These conditions are expected to continue during the next month or two.

Heavy Chemicals

A quiet trade has been passing in hyposulphite of soda, offers of which this week have been at round £15 10s. per ton for photographic and from £9 5s. to £9 10s. for the commercial material. There is a fair inquiry about for bichromate of soda, and values are steady at 3d. to 3¼d. per lb. Quotations for saltcake are still on the basis of £2 12s. 6d. per ton, but the demand this week has been inactive. Sulphide of sodium is attracting only a very moderate volume of buying interest and quotations are on easy side at about £9 15s. per ton for the 60-65 per cent. concentrated solid and £7 15s. for the commercial. A quietly steady trade continues to be done in caustic soda, and prices are fully maintained at from £13 7s. 6d. to £15 7s. 6d. per ton, according to quality. Chlorate of soda has been moving off only in comparatively small quantities, but there has been little change in the price situation, current offers of this being at round 3d. per lb. Alkali is in fair request, and makers' prices are fully maintained at round £6 2s. 6d. per ton. The demand for nitrite of soda this week has been rather slow, although quotations keep fairly steady at up to £19 15s. per ton. A limited business is being done in the case of phosphate of soda, values of which range from £12 to £12 10s. per ton. Bleaching powder is moving off in moderate quantities, and sales have been reported down to £6 15s. per ton, although £7 is still the basis price for British material. Bicarbonate of soda is about unchanged at £10 10s. per ton and a fair inquiry for this material is being met with. There is a moderate demand about for prussiate of soda, values of which are firm at 4½d. to 5¼d. per lb., according to quantity.

Caustic potash is well held at from £33 5s. per ton for prompt delivery of one to five-ton lots, and a fair inquiry is reported. The demand for carbonate of potash this week has been on somewhat quiet lines but values are steady at up to £25 5s. per ton. There has been no special feature about sales of yellow prussiate of potash but offers of this still range from 6¾d. to 7½d. per lb., according to quantity. Permanganate of potash has an easy tendency and inquiry is slow; B.P. quality is quoted at round 5d. per lb. and commercial at 4⅞d. to 4¾d. Chlorate of potash is in quiet request at round 3d. per lb., with bichromate of potash steady and in moderate demand at from 4d. to 4¼d. per lb.

There has been virtually no change on the week in the position of sulphate of copper, a fair business being put through at from £26 to £26 5s. per ton. There has been little or no expansion in the demand for arsenic, moderate sales having been made at round £17 per ton at the mines, for white powdered, Cornish makes. The lead products are rather slow and values are easy, nitrate being quoted at £36 10s. to £37 per ton, white acetate at round £40 per ton, and brown acetate at £39. The demand for acetate of lime is on the quiet side, but prices are well held at £16 5s. to £16 10s. per ton for grey material and about £9 10s. for brown.

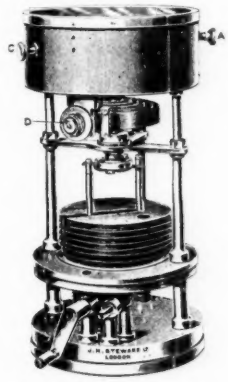
Acids and Tar Products

Oxalic acid remains fairly steady at from 3¼d. to 3½d. per lb., according to quantity, and meets with a moderate inquiry. Tartaric acid is slow and somewhat easier at 1s. 3½d. to 1s. 4d. per lb., with citric acid also a quiet section at about 1s. 10½d. per lb. Acetic acid is held for recent prices, glacial being offered at £66 to £67 per ton and 80 per cent. commercial at £36 10s.

Little important business is passing in pitch, and quotations are nominal at £2 17s. 6d. to £3 per ton. Solvent naphtha is in moderate request and prices are maintained at about 1s. 1d. per gallon. There is not much business offering in the case of carbolic acid and at about 2s. 2d. per gallon for crude material and 6⅜d. per lb. for crystal the price tendency is easy. Creosote oil keeps quiet but quotations are still in the neighbourhood of 6½d. per gallon.

A Friction Machine for Testing Oils

For the rapid and accurate estimation of the "oiliness" and lubricating value of oils, the static friction between any desired metals may be used, and this principle is applied in the Deeley Friction Machine. This apparatus finds many applications in the testing of oils. The static frictional value of any particular mineral oil can be ascertained, to determine its suitability as regards oiliness for blending purposes. The blended oil can be tested for oiliness to ascertain if the required standard has been attained. Merchants and users of lubricating oils can also ascertain, by a quick test, whether the lubricating oils supplied or used are up to the quality specified, or the required standard. In scientific laboratories the



The Deeley Friction Machine.

machine will be found useful, as the chemical changes which take place on metallic and other surfaces, when brought into contact with various liquids and gases, reveal their actions by changing the *oiliness* of the surfaces. In Universities and technical schools it may be installed for the purpose of demonstrating and studying both low-speed kinetic and static frictional laws. The Deeley Friction Machine is manufactured by J. H. Steward, Ltd., of 406, Strand, London.

Monel Metal

A complete series of pamphlets on Monel metal, in a neat wrapper, has been issued by Monel-Weir, Ltd., of Cathcart, Glasgow, sole concessionaires for this product in Great Britain and Europe. Notes are given on the properties and uses of Monel metal. There is a buyers' guide dealing with the various forms of plant and apparatus made from it, and of the British firms who supply their products made wholly or in part of it. The range of products made in Monel metal is increasing. There are illustrations of a 6-ton capacity autoclave internally lined and fitted with Monel metal; of Monel metal baskets for drying neutral sulphate of ammonia; of a Monel metal pantry, the tables, dresser and draining board being covered with it, and the trays, basins, etc. consisting entirely of it; of various Monel metal apparatus for use in surgery (sponge bowls, dressing basins, sterilising drums, instrument trays, etc.). A rather novel application is a tower top of Monel metal in a modern business building in London, the trusses, moulded cornices, and pediment dormer tops being covered with Monel metal. These and numerous other uses of the metal arise from its resistance to superheated steam, high temperatures, alkaline conditions, acids, and corrosive action generally.

£1,500 Worth of Prizes

If you will spare one shilling towards the best of charitable causes—The John Benn Hostel for East End Working Boys in Stepney—there is still time for you to win one of the 350 prizes in the Boys Ballot organised to raise much-needed funds. A saloon motorcar, valuable furniture, trips abroad, gramophones, and a host of other attractive gifts are offered as prizes in this fascinating competition. Tickets, 1s. each (book of 11, 10s.), and all particulars may be obtained from the Ballot Organiser, c/o Sir Ernest Benn, Bouverie House, Fleet Street, London, E.C.4.

Company News

AMERICAN SMELTING AND REFINING CO.—A quarterly dividend of 2 per cent. on the common stock is announced, payable to holders on record on July 13.

JOHN KNIGHT.—A dividend on the 25 per cent. cumulative preferred ordinary shares is payable on July 31, at the rate of 12½ per cent., for the half-year to May 31 last.

SOUTH METROPOLITAN GAS CO.—The directors have declared an interim dividend on the ordinary stock at the rate of 5 per cent. per annum for the half-year ended June 30.

W. AND H. M. GOULDING.—A dividend at the rate of 5½ per cent. on the preference shares is announced, and 5 per cent. per annum on the ordinary shares, for the year ended June 30.

ROPP TIN.—A final dividend of 10 per cent., less tax, is recommended for the year 1927, making a total of 30 per cent. for that year, payable on August 13, 1928, to shareholders registered on July 23.

CHEMICAL NATIONAL BANK OF NEW YORK.—A statement of the condition at the close of business on June 30, 1928, shows assets totalling $222,124,616. Deposits amounted to $156,914,799, and the surplus and undivided profits $20,014,499.

BRITISH CYANIDES.—The company announce that a dividend at the rate of 10 per cent. per annum, free of tax, will be paid on the preference shares, in respect of the year ended June 30, on August 15 next to preference shareholders registered on the books as on July 31, 1928.

TARMAC, LTD.—The directors have decided not to make any interim distribution for the year 1928 to the holders of ordinary shares. The interim dividend last year was 2 per cent., and the final 2½ per cent., making 4½ per cent. Nothing was paid in respect of 1926, while for 1925 a tax-free distribution of 10 per cent. was made.

WELSBACH LIGHT CO.—The balance to the credit of profit and loss account for the year ended March 31, 1928, is £2,072, which, with the balance brought forward of £4,323 and a proposed transfer from general reserve of £323 make a total credit of £6,718. The board recommend a dividend of 2½ per cent. (less income tax), carrying forward £269. The annual meeting will be held at Winchester House, London, E.C., on July 31, at 2 p.m.

L. AND N. COAL DISTILLATION.—The first accounts covering the period from February 18, 1927, to March 31, 1928, show: Paid-up capital, £247,993; sundry creditors, £19,073; patent rights, etc., £150,256; buildings and plant, £47,224; cash, £47,031. Preliminary expenses appear at £5,619, and development, office, and general expenses at £12,952. The report states that the period has been devoted to preparing groundwork for the company's activities, and principally to the erection of a commercial unit. This has now been put into successful mechanical operation.

Utilisation of New Brunswick Oil Shales

ACCORDING to Mr. E. A. Beckert, consulting engineer of the Maritime Education Co., Ltd., exploitation of the extensive oil shale deposits of Albert County, New Brunswick, is to be begun very shortly. The company's plant at Rosevale is now almost ready to go into operation, and will be capable of producing 5,000 gallons of oil per day, together with numerous by-products. About 75 men will be employed, and so extensive is the deposit of shale to be exploited that it runs into many square miles and is estimated to contain billions of tons of oil shale. A feature of the plant is a giant retort utilised to cook the shale, which has a capacity of 130 tons daily.

Centralisation of Nitrate Sales

THE Chilean Government, who have been making a careful study of the nitrate industry, have called upon the Producers' Association to formulate a scheme for the centralisation of sales in consuming markets so as to obviate a recurrence of cut-throat competition. This request has been acted upon, and a committee has now been formed in London, consisting of nine representatives of producers and two representatives of distributors, to study the scheme which the Producers' Association have formulated, with a view to making recommendations as to the best methods of carrying it out in time for the next consuming season.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal" have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

MARKET FOR CHEMICALS IN CHILE.—A confidential report on the market for chemicals in Chile has been prepared by the Department of Overseas Trade from information furnished by the Commercial Secretary at Santiago (Mr. W. F. Vaughan Scott), and issued to firms whose names are entered on its Special Register). United Kingdom firms desirous of receiving a copy of this report, together with particulars of the Special Register service of information and form of application for registration, should communicate with the Department of Overseas Trade. (Reference No. B.X. 4538.)

PHOSPHORIC ACID PASTE.—An important Montreal firm is desirous of being placed in touch with United Kingdom manufacturers of phosphoric acid paste, 48–50 %, in five ton lots. (Reference No. B.X. 4593.)

LINSEED OIL.—The South African Railways and Harbours Administration is calling for tenders, to be presented by September 6, for the supply and delivery of raw and boiled genuine vegetable linseed oil (Tender No. 1288.) (Reference No. B.X. 4603.)

CREOSOTE OIL.—The Director-General, India Store Department, Belvedere Road, Lambeth, London, S.E.1, invites tenders for 20,000 gallons creosote oil. Tenders due July 31, 1928. Forms of tender obtainable from the above at a fee (which will not be returned) of 5s. for each Schedule.

CHLORINATING PLANT.—The Council of the City of Cape Town is inviting tenders for the supply and delivery free on rail at Steenbras Siding, near Cape Town, of a complete chlorinating plant (solution type), with a maximum capacity for treating 18 million gallons of water per 24 hours, at a maximum rate of 1·5 parts of chlorine per million parts of water. Tenders must reach Cape Town not later than noon on August 21, 1928. (Reference A.X. 6600.)

I.G.'s Swiss Subsidiary

Functions Unknown

THE reported formation of a German-Swiss dye trust is discussed at length by a correspondent in the *Financial News*. The correspondent states that "it is indeed a fact that a company with a capital of 20,000,000 francs has lately been registered in Basle under the name of 'Internationale Gesellschaft fur Chemische Unternehmungen A.-G.' But this flotation has nothing whatever to do with the Swiss dye industry. Neither the Interessengemeinschaft of the three great Swiss firms manufacturing aniline dyestuffs nor any of its constituent members has an interest in the new company, as has been officially stated.

"The newly-founded company is simply a subsidiary of the I.G. Farbenindustrie A.-G. The objects of the company are described as 'participation in the chemical industry,' but it is not known what special functions the I.G. has assigned its new enterprise. It is suggested that the company is intended to replace the existing private agency of the parent trust in Switzerland, as being more effective and, in the long run, cheaper.

"The *Frankfurter Zeitung*, however, surmises, according to its own information, that the company has the 'character of a preparatory undertaking for future business ventures' of the I.G. Nothing more definite as to its intended activities has, according to this newspaper, as yet been decided, and its seemingly precipitous flotation at the end of June is explained by the fact that on July 1 the Swiss registration tax for companies was raised from 1·5 to 1·8 per cent. The board of the new company includes a director of the Elektrobank at Zurich, but the latter financial institution is not participating with its own funds. As to the rumoured absorption of the Swiss dyestuffs industry by the German trust, nothing of the kind is intended at Basle. The Swiss interests, though small in comparison with the giant organisations of their competitors, are technically and financially quite strong enough to resist such one-sided alien domination, which could not conceivably be advantageous to the further development of this important Swiss industry."

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

SOLVO CHEMICAL CO., Smithy Bridge, Rochdale, chemical manufacturers. (C.C., 28/7/28.) £12 9s. 10d. June 23.

Mortgages and Charges

[***NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.***]

DIXON'S WHITE, LTD. (late RAGOSINE AND CO., LTD.), London, E., oil merchants. (M., 28/7/28.) Registered July 5, Land Registry charge, to Bank; charged on Albion Wharf, Bow. *£16,000. January 31, 1928.

Satisfaction

KALSOMO, LTD., Nottingham, soap manufacturers. (M.S., 28/7/28.) Satisfaction registered July 7, £900 registered August 24, 1927.

London Gazette, &c.

Companies Winding Up Voluntarily

KEPHALDOL, LTD. (C.W.U.V., 28/7/28.) By special resolutions, June 26, confirmed July 11. F. J. H. Chalmer, 264, Salisbury House, London Wall, E.C., appointed as liquidator. Meeting of creditors at liquidator's office, on Tuesday, July 31, at 2.15 p.m.

STANDARD PETROLEUM EXPLORATION CO., LTD. (C.W.U.V., 28/7/28.) By reason of its liabilities, July 18. H. Hagon, 82, Victoria Street, Westminster, S.W.1, appointed as liquidator. Meeting of creditors 15, Grosvenor Mansions, 82, Victoria Street, Westminster, S.W.1, Tuesday, August 7, at 11.15 a.m.

WESTMINSTER OIL SYNDICATE, LTD. (C.W.U.V., 28/7/28.) By reason of its liabilities, July 18. H. Hagon, 82, Victoria Street, Westminster, S.W.1, appointed as liquidator. Meeting of creditors, 15, Grosvenor Mansions, 82, Victoria Street, Westminster, S.W.1, Tuesday, August 7, at 11 a.m.

Notice of Intended Dividend

ANDERSON, Arthur, trading as HUDSON AND CO., and ARGONAUT VARNISH CO., Bevis Works, Atlas Road, Victoria Road, Willesden Junction, N.W., gum and shellac merchant and varnish manufacturer. Last day for receiving proofs, August 3. Trustee: F. F. Sharles, Salisbury House, London Wall, E.C.2.

New Companies Registered

ALLIANCE ARTIFICIAL SILK, LTD.—Registered as a "public" company on July 18. Nominal capital £1,550,000 in 5s. shares. To adopt an agreement with the International Artificial Silk Co., Ltd., and to carry on the business of manufacturers of and dealers in artificial silk or artificial fibres, filaments and yarns, whether made from acetate of cellulose or other substance or material, or by the viscose or other process, manufacturers of and dealers in cellulose acetate, acetic and other acids, dyes, pulp, chemicals, etc. A subscriber: N. Alexander, 22, Ashburn Place, London, S.W.7.

MIDLAND LABORATORY GUILD (1928), LTD.—Registered on July 23, as a company limited by guarantee and not having a share capital, with 20 members, each liable for £50 in the event of winding-up. To promote, maintain and control research and other scientific work in connection with the ferrous or non-ferrous trade or industry; to establish, form, equip and maintain chemical, metallurgical, physical and mechanical laboratories; to carry on the work of chemical and metallurgical chemists, and the physical and mechanical examination of metals and alloys, etc. The management is vested in a board of directors, the first members of which are: A. H. Wolseley, 37, Wellington Road, Edgbaston, Birmingham; G. Parsons, W. H. Henman, J. H. Allen, W. H. Williams, H. W. Williams, F. W. Wharton, G. H. Dugard, W. F. Watkins and C. C. Bamford.

RAINFORD TAR PRODUCTS, LTD. Registered July 23. Nom. capital, £1,500 in 1s. shares. Producers, refiners, storers, distillers, distributors and manufacturers of and dealers in tar, pitch, bitumen, casein, oil, petroleum, petroleum products, soda, soap, resin, naphtha and all kinds of oil, oleaginous, bituminous, saponaceous, mineral, synthetic and natural substances and substitutes, etc. A subscriber: H. L. Swire, 92, Ramillies Road, Bedford Park, London, W.4.

Non-Inflammable Film Co. Report

THE NON-INFLAMMABLE FILM CO., LTD., which was formed in January last year to acquire the Empire rights (excepting Canada) in certain processes relating to the manufacture of cellulose acetate and the conversion into non-inflammable film, has just issued its first annual report. The report covers the period ended April 30, 1928. Towards the end of 1927 the directors accepted an offer for the Lancaster works with the acetate machinery already purchased and the benefit of the contracts placed, and for the patents and processes for the manufacture of cellulose acetate. Under the arrangements the supply of acetate to the company on satisfactory terms is covered, and the purchasers have the right to use its acetate for the production of artificial silk only, its use for all other purposes being reserved to this company. As consideration for this sale, the company received £150,000 in cash and 250,000 deferred shares of 1s. each fully paid in the Cellulose Acetate Silk Co., Ltd., and two of the directors, Dr. Herbert Levinstein and Sir John Pennefather, have been elected to the board of that company. In co-operation with John M. Newton and Sons, Ltd., a company has been formed to manufacture safety glass for motor cars and all other purposes under the title of Newtex Safety Glass Co., Ltd. The Non-Inflammable Film Co. received for its patent and process relating to such glass 100,000 ordinary shares of 5s. each fully paid and the right to subscribe at par for 150,000 deferred shares of 1s. each in that company, in addition to a royalty of 1½d. on each square foot of safety glass sold. The right to purchase these deferred shares has been exercised. Three members of the board, Sir Herbert Blain, Dr. Levinstein and Sir John Pennefather, have been appointed directors of the Newtex Co. Negotiations are taking place in other directions from which developments are expected.

Application for Marking Imported Copper

THE Standing Committee of the Board of Trade appointed under the Merchandise Marks Act sat at the Board of Trade Offices under the chairmanship of Sir H. Llewellyn Smith on Monday, to consider an application requiring the marking of the country of origin on imported copper plates, sheets, strips, and other rolled sections, rods and wire (other than insulated wire), and tubes. Mr. Gwatkin, who appeared for the applicants, the High Conductivity Copper Association, the Manufactured Copper Association, and the Brass and Copper Tube Association, said the application was for a sales order only, and not for an importation order. Mr. A. S. Williams opposed the application on behalf of certain Newcastle, Glasgow and Dundee firms. Mr. H. J. Skelton, of the iron, steel, tinplate, and metal merchants' section of the London Chamber of Commerce, said that as the result of a conference they had agreed on a form of marking. They now thoroughly approved of the application. The inquiry was closed, the Chairman intimating that the Committee would report to the Board of Trade.